2019

Trade liberalization and performance The impact of WTO accession on firm productivity, turnover and exports in the case of Vietnam's manufacturing sector: 2007-2013

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TRADE LIBERALIZATION AND PERFORMANCE

THE IMPACT OF WTO ACCESSION ON FIRM PRODUCTIVITY, TURNOVER AND EXPORTS IN THE CASE OF VIETNAM'S MANUFACTURING SECTOR: 2007-2013

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This thesis is presented as part of the requirement for the conferral of the degree:
Doctor of Philosophy

University of Wollongong
School of Accounting, Economics and Finance

March 2019

Abstract

Since the landmark event in 2007 of the accession to the WTO, it was expected that extensive trade reforms and the accelerated pace of integration with the global economy would positively contribute to the performance of the manufacturing sector in Vietnam. This thesis aims to make an additional contribution by examining the performance of the Vietnamese manufacturing sector in the face of trade liberalization and market-oriented transition reforms.

The thesis starts with the examination of the effects of trade reforms on manufacturing performance at the firm level from 2007 to 2013. The semi-parametric approach developed by Levinsohn and Petrin (2003) is used to control for simultaneity bias in the estimation of a production function and to obtain TFP estimates. The finding that lower levels of protection are significantly associated with higher firm productivity in Vietnam lends some support to the proposition that trade opening has a positive impact on promoting the manufacturing performance of many developing countries.

The thesis also examines productivity differentials across firm's turnovers using cohort analysis. The analysis finds crucial evidence that turnover patterns reflect significant differences in productivity. By the expansion of employment size and the reduction of capital intensity, the surviving firms become more efficient than before. This trend induces manufacturing firms to exploit cheaper production factors in a more competitive market, which is consistent with the patterns of Vietnam's manufactured trade specialization.

The study further examines the causality relationship between exporting and firm productivity in an emerging market economy on the path of trade liberalization and market-oriented transition reforms. To achieve this purpose, testing whether only the most productive firms can overcome a productivity threshold to enter export markets (self-selection) or whether firms that enter export markets observe a subsequent productivity improvement (learning-by-exporting) is implemented. A random-effects dynamic probit model and a matching technique in combination with difference-in-difference approach are

implemented to test the causality from firm characteristics to export probability for the existence of learning-by-exporting effect. The econometric results indicate not only that productive firms self-select into exporting but also that their productivity is enhanced further following their entry. The findings are largely consistent with the growing evidence from other emerging economies, supporting the export-led growth strategies that Vietnam is pursuing.

The study ends with policy implications for Vietnam's strategy to achieve long term productivity in the context of trade opening.

Acknowledgements

This thesis would not have been completed without the help, support and encouragement from my supervisors, family, friends and colleagues.

I would firstly like to express my sincere gratitude to Dr Kankesu Jayanthakumaran for being my principal supervisor during my PhD study and research at the University of Wollongong, Australia. It has been a great honour for me to do my thesis under Dr Jayanthakumaran 's supervision. He always gives me very detailed and valuable advice on my research with much time as well as guidance to achieve the ultimate goal of my research work. His generous support is significant not only in the academic aspects, but also in career development in the future. Without his encouragement, advice, support and research training, it would have been impossible for me to complete my PhD study. I am also deeply grateful to my co-supervisor A/Prof. Ed Wilson for sharing his strong research experience with me and giving me many good ideas to improve my research. Specially, he spent a lot of time to give me valuable comments on my proposal and thesis. My thanks also go to my friends at Wollongong, Quynh, Truc, Han, Andy, and especially Liz Hilton. They make my life in Wollongong so memorable.

I would like to thank my mother for her care, support and encouragement to me during my PhD study and research. My husband Dien Tuan Le and my child Dien Thang Le always give their support, encouragement and understanding and love to me. They are always fun, enjoyable and enable me to recharge energy from my research stress. Without their help, it would have been difficult for me to complete my thesis. In addition, I am also grateful for my young sister for special care and encouragement in my life.

Finally, my thanks are extended to the MOET-VIED scholarship from the Vietnamese Ministry of Education and Training (MOET) through the Vietnam International Education Development (VIED) and University of Wollongong for the financial support during my PhD study and research. I also thank the School of Accounting, Economics and Finance for providing me a high quality study and research environment, and financial support during my PhD study and research. I

am truly grateful for John Mahony’s help to proofread my thesis.

Certification

I, Dang My Phuong Phan, declare that this thesis submitted in fulfilment of the requirements for the conferral of the degree of doctor of philosophy in the School of Accounting, Economics and Finance, the University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. This document has not been submitted for qualifications at any other academic institution.

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Dang My Phuong Phan
28th March 2019

List of Names or Abbreviations

ACFTA	ASEAN-China Free Trade Agreement
AFTA	ASEAN Free Trade Area
AANZFTA	ASEAN -Australia-New Zealand Free Trade Agreement
APEC	Asia- Pacific Economic Cooperation Forum
ASEAN	South East Asian Nations
BTA	Bilateral Trade Agreement
CEPT	Common Effective Preferential Tariff (ASEAN)
EPZs	Export Processing Zones
FDI	Foreign Direct Investment
FIEs	Foreign-Invested Enterprises
ITA	Information Technology Agreement
LFI	Law on Foreign Investment
LP	Levinsohn and Petrin
GDP	Gross Domestic Product
GSO	General Statistic Office of Vietnam
MFN	Most Favoured Nation
NRP	Nominal Rate of Protection.
OECD	The Organization for Economic Co-operation and Development
OP	The Olley and Pakes method
R&D	Research and Development
SBV	the State Bank of Vietnam
SOEs	State - Owned Enterprises
TFP	Total Factor Productivity
TPP	Trans-Pacific Partnership Agreement

VES	Vietnam Enterprise Survey
VSIC	the Vietnam Industrial Standard Classification
USVBTA	The Vietnam and United States BTA
WTO	World Trade Organization

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Chapter 1

Introduction

1.1 Context of the issue

Trade has historically played an important role in fostering a country's economic development. Supporters of the market model believe that trade flows could create numerous opportunities for better performance of firms around the world through offering the right price. Firms utilize their comparative advantages in the production of goods to improve productivity and export ability. Governments implement policies using trade as a main driving force of economic growth and optimizing resources allocation. Vietnam, which is an emerging economy, is no exception in this regard.

Such policies on this path were gently initiated in Vietnam only after the introduction of Doi Moi (Renovation) in late 1980s. In line with numerous policies, industrialization has been considered as a leading mission to transform from a centrally planned economy to a market-based economy. At the same time, trade openness takes place in line with the FDI attraction into the economy, creating rapid changes in social and economic aspects. As a result, Vietnam had escaped from being one of the poorest countries in the world with hyperinflation and economic crisis at the end of the 1980s, joining the team of lower middle-income countries in 2010 (World Bank, 2012).

Since Renovation, Vietnam has engaged in various bilateral and multilateral trade agreements. In 1995, Vietnam became a member of ASEAN and joined APEC in 1998. In 2000, Vietnam entered into a bilateral trade agreement with the USA (USVBTA), making a crucial step to join the global trading system. Following this, Vietnam committed to the ASEAN Free Trade Area (CEPT/AFTA) in 2001 and the ASEAN-China Free Trade Agreement (ACFTA) in 2002. Vietnam also signed commitments with the partners of the Trans-Pacific Partnership Agreement (TPP) in 2015.

After three decades of Renovation, Vietnam has learned valuable lessons and it is aiming for a new development dynamism. By becoming a WTO member, the Vietnamese goods will immediately be treated more fairly on the world market; as a result, exports can be accelerated. On the other hand, with WTO membership, the door

to the domestic market is wide open, it could be expected that investors will enter Vietnam to boost exports to the world market. Thus, by the Vietnamese government' s effort after 11 years of preparation with 15 rounds of negotiations, Vietnam officially became the 150th member of the World Trade Organization (WTO) in 2007. This was an historic milestone for Vietnam's further international economic integration (World Bank, 2016).

The accession to the WTO ensures that trade flows more smoothly and freely. Thus, it is believed that WTO members have a more predictable access to foreign markets subsequently leading to higher exports performance. Another economic rationale is the attraction of FDI into the economy, creating a driving force of industrialization and growth (Thanh, 2010). Vietnam's WTO accession might be considered a stronger commitment in terms of government administration towards the market paradigm.

As an official member of the WTO, Vietnam has made commitments with other members over a range of sectors. Vietnam has agreed to bind its tariffs from 0 percent to 36.7 percent for most products. There is the tariff reduction of 3,900 tariff lines (approximately 37 percent of total tariff lines). Furthermore, 3,600 tariff lines (approximately 34 percent of total tariff lines) have been maintained on current rates and 3,056 tariff lines (approximately 29 percent of total tariff lines) have been bound by the ceiling rate. It has also committed to average tariff rates declining from 18.3 percent to 12.4 percent after 8 years since the date of accession (World Bank, 2012). As Vietnam's commitment under the WTO, the period 2007–2013 witnessed significant changes in the foreign trade regime including reductions in the average tariff rates and removing non-tariff barriers.

To a certain extent, early attempts to liberalize trade before WTO accession and particularly the implementation of WTO commitments have led to the harmonization of the fulfilment of Vietnam's commitments within the CEPT/AFTA framework. Many restrictions on investment and trade have been removed. The new laws and regulations are more transparent and accessible to the public. The objective is to promote the country's foreign trade by liberalizing trade within the Committed Schedule to the WTO members and consequently, speeding up economic reforms. Hence, the Vietnamese economy in general and its manufacturing sector in particular have undergone an era of opportunities and challenges under WTO practices.

In such a context of economic integration, the manufacturing sector is dominant in achieving industrialization. By 2014, this sector contributed around 35 percent of the economic growth, 96 percent of industry's growth in value added and 66 percent of export Volume, and generated 46–50 percent of total jobs (Tran, 2016). Transition to a market-oriented economy was associated with ownership diversification in entrepreneurial development. The private sector enterprises had been promoted more than in the previous period. Meanwhile, the expansion of the FDI businesses in the manufacturing sector resulted from the flexible FDI policy. These changes pushed domestic producers under a high degree of competition for export. The issue arising is the need to promote a diversified economy, not one mainly based on agricultural products which portends great risk to the economy. Thus, the Vietnamese manufacturing appears to be a valuable case for testing the impact of WTO accession in an emerging economy.

The empirical literature examining the links between trade openness and firm performance has been increasingly accumulated to a large scale in both developing and developed countries (Winter, 2004; Coelli, 2005; Syverson, 2011). Although most empirical studies have found significant evidence for the positive effect of trade openness, there are very few studies on the specific channels of the impact of trade liberalization on productivity gains in a transitional period from a centrally planned to a market- oriented economy.

From a theoretical perspective of standard trade models, scarce resources are reallocated toward industries which are relatively more productive, called trade-induced cross-industry allocation. The orthodox approach makes a plausible and convincing prediction that trade opening will induce resources to move into production activities whose output is intensive in the use of production factors abundant in that country (Winters, 2004). However, it is assumed that all firms are identical and their behaviour is the same under the same circumstances. A firm's performance may be influenced by its own firm-specific characteristics. It is shown that firm heterogeneity exists in firms operating in domestic and overseas markets. Thus, it is established in a number of studies that firm heterogeneity analysis is superior to industry analysis.

Melitz (2003) and others develop the models using the basics of firm heterogeneity to explain the degree of export participation. Melitz includes heterogeneous productivity in monopolistic competition. In his study, international

trade was considered a channel for reallocation of resources among firms in an industry. It is argued that more productive firms would gain market share from less productive ones and even the least productive firms will exit the market due to the tariff reduction.

The framework of heterogeneous-firm trade (Melitz, 2003) is adopted appropriately in this study to gain a clearer insight into the extent of WTO accession in the manufacturing sector of Vietnam. This firm analysis is more reasonable for trade policymakers because it incorporates differences between firms, not only focusing on industry differences. The era of free trade tends to support individual firms through R&D process and human capital development in a different pace. Hence, applying the concept of firm heterogeneity helps to examine how the manufacturing sector responds to WTO accession more comprehensively.

In the context of the accumulation of the empirical literature on trade openness and firm performance, this thesis will contribute to the literature by investigating the links to which significant trade liberalization affected firm productivity, firm turnover, and exporting in Vietnam, a new developing WTO member that underwent a transformation from a centrally planned to a market-oriented economy. This distinct feature of this study also comes from the fact that there are few comprehensive and systematic studies on the relationship between trade opening and manufacturing performance in transitional economies. In addition, the availability of national enterprise survey data in Vietnam since 2000 made it possible to examine the specific channels of the impact of WTO accession on manufacturing performance.

1.2 Objectives

The overall objective of this thesis is to examine the impacts of WTO accession on the performance of the manufacturing sector in Vietnam in terms of total factor productivity, firm turnover and exports ability based on firm-level production data as well as disaggregated trade data.

The specific objectives of the study are as follows:

i. To investigate the effects of WTO accession on Total Factor Productivity (TFP) in the Vietnamese manufacturing firms.

ii. To evaluate the effects of firms' TFP on the competitive selection process in the Vietnamese manufacturing firms.

iii. To determine the impact of TFP on firms' export participation in the manufacturing sector in Vietnam.

The study aims to empirically examine the performance of the Vietnamese manufacturing sector in the face of trade liberalization and market-oriented transition reforms.

1.3 Research questions and hypotheses

The figure below illustrates the general framework of this study.

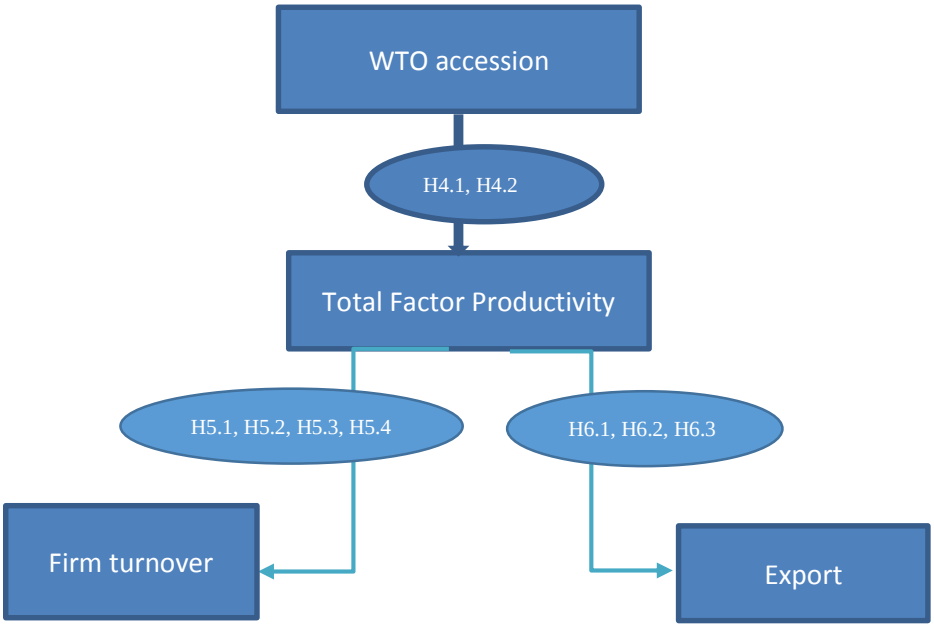

Figure 1.1: Framework of the study

***Source**: Author's construction*

Figure 1.1 shows the three aspects that may be influenced by WTO accession including total factor productivity, firm turnover, and export. Based on the framework, 9 hypotheses will be developed for this research in three empirical chapters.

Consistent with these objectives, the thesis seeks to provide answers to the following questions:

Q1. Does reduction in tariffs on output increase firm-level productivity in Vietnam?

Q2. Does reduction in tariffs on inputs raise firm-level productivity in Vietnam?

Q3. Are there productivity differentials across firm turnover in Vietnamese manufacturing?

Q4. Does firm productivity improvements increase exports in Vietnam?

Q5. Do exporting activities enhance firm productivity in the Vietnamese manufacturing sectors?

Based on the above research questions, a number of hypotheses are addressed in Chapters 4 to 6. They are as follows:

H4.1: Output tariff reduction increases firm-level TFP.

H4.2: Input tariff reduction increases firm-level TFP.

H5.1: Exiting firms have lower TFP levels than incumbents.

H5.2: Entry firms have lower TFP levels than incumbents.

H5.3: Entry firms are more productive than surviving firms.

H5.4: Firm productivity improvement is the main contributor to productivity growth.

H6.1: Exporting manufacturing firms are more productive than non-exporting ones.

H6.2: More productive manufacturing firms are more likely to enter into export markets.

H6.3: Vietnamese manufacturing firms increase their productivity by learning-by- exporting.

1.4 Significance of the study

This study contributes to the literature in that this is one of the most comprehensive and systematic studies focusing on the relationship between joining the WTO and manufacturing performance in an emerging economy. There are a number of previous studies related to technical efficiency with WTO membership but they do not examine the specific channels of the impact of the WTO on manufacturing performance on a specific case of a developing country (Vu, 2002; Chu and Kalirajan, 2010; Carlin and Pham, 2018;). This quantitative study with rich data could release more persuasive

and informative research results.

The study goes further than previous studies on the productivity of the Vietnamese manufacturing sector that estimates input tariff and output tariff based on the 2012 IO table. This table helps to capture dynamic changes of the technical relation between IO industries. The study also uniquely applies several complex estimation techniques to calculate input and output tariff. Compared with other available studies, this application of input and output tariff is the most comprehensive examination of manufacturing protection in Vietnam. Furthermore, a review of empirical studies on the relationship between trade liberalization and the Vietnamese manufacturing sector is undertaken to explore the gaps in the empirical literature.

This study goes further than current studies on productivity by examining heterogeneous characteristics of firms in the explanation of different performance in the context of a newly-emerging economy. Based on this, more accurate interpretation would be expected for the real circumstance of Vietnam.

Vietnam's manufacturing sector is considered an interesting experiment for examination of the impact of post-WTO accession on performance. Manufacturing is a dominant sector in an economy, allowing us to test the effect of reforms which have accompanied trade liberalization. Moreover, a proper understanding of the impact of the WTO on the Vietnamese manufacturing sector is crucial for designing supporting policies to enhance the country's integration into the world economy.

1.5 Organization of the study

This thesis contains seven chapters. Chapter 2 reviews the whole process of trade liberalization especially since Vietnam joining the WTO. The chapter starts by providing an overview of Vietnam's economy as a start of the empirical analysis with a particular emphasis on various trade and other policy reforms from 1990 to 2015. This part begins with a review of the process of Vietnam's international economic integration, indicating the important points in the timeline of changes of Vietnam's trade and investment policy regime. This review highlights the changes in business environment, reducing protection for the manufacturing sector. It also reveals the macroeconomic context to discern how the economy performed and the contribution of manufacturing to the economy compared with other sectors.

Chapter 3 aims to introduce a detailed review of theoretical background to clarify the research questions in the thesis. This chapter focuses on the evidence of theoretical models of trade and endogeneity emphasizing the relationship between trade opening and productivity and the link between productivity and exporting. The aim of Chapter 3 is also to build up the conceptual framework to support the terminologies and methodologies sections. It also provides stylized facts on trade liberalization, productivity and export in the Vietnamese manufacturing sector.

Chapter 4 examines the impact of trade liberalization on firm productivity in Vietnam at the firm level. The analysis is carried out using a panel data of Vietnamese manufacturing firms from 2007 to 2013. This chapter specifically focuses on whether trade reform since the WTO's accession of Vietnam has significant and consistent effects on the productivity of manufacturing firms. In addition, the chapter also investigates the mechanism in which the reductions in trade protection could improve TFP at firm-level in Vietnam. Methodologies to measure TFP are in the second section. Among them, the selected method for this study and the reasons for the choice are stated. In order to measure TFP, the Levinsohn and Petrin (2003) method is applied, controlling for the simultaneity bias in the estimation of a production function. The output tariff and input tariff are estimated to examine how trade policy reforms led to the reduction of manufacturing protection. The effect of tariff reductions on firms' TFP is examined by the fixed-effect model. Firm-specific characteristics are taken into account in the model. At the same time, the estimation results are compared with the findings of available studies on other developing countries.

Chapter 5 further investigates the productivity differentials among firms, firm turnover, and aggregate productivity growth in the Vietnamese manufacturing sector under trade liberalization. This chapter discerns how manufacturing firms respond to the progress of reforms in the trade regime. To address these issues, instead of a firm-level regression analysis, a descriptive analysis is employed to obtain the implications for the reallocation and entry and exit phenomena. Then, the growth of TFP is observed since Vietnam joined the WTO in January 2007 to detect the changes in TFP patterns in line with trade opening.

Chapter 6 presents the results of an extensive investigation of the causal relationship between productivity and exports by using a firm-level dataset covering the Vietnamese manufacturing sector which spans the period from 2007 until 2013. It

examines the export premium which is defined as differences between exporters and non-exporters for consistent comparisons between exporters and non-exporters in the Vietnamese manufacturing sector. Then, two usual dimensions in the trade literature including self-selection and learning-by-exporting in Vietnam's context are examined. By testing these two hypotheses, the causality between firm characteristics with focus on TFP and export behaviour is confirmed. In this chapter, both firm and industry-specific characteristics are taken into account in a probit model to examine the decision of a firm's export participation. The study further employs a matching technique to investigate whether there are any links in terms of exporting activity affecting productivity.

Lastly, Chapter 7 provides a summary of the key findings of the study and the conclusions reached. After that, policy implications extracted from these results for Vietnam's industrialization in the context of trade opening are then considered. This chapter also indicates the scope of further research on the relationship between trade openness and firm performance.

Chapter 2

Country background

2.1 Introduction

Lying in the Indochina Peninsula region with neighbours being China in the north, Laos and Cambodia in the west, and long coastline approaching the Indochina Sea in the east, Vietnam has an extremely convenient location for transportation of commodities around the world. With the total land area of 331,698 square km, the Vietnamese population size has remained at a high level over time, about 91.7 million in 2015, making Vietnam the 13th most populous country in the World (World Bank, 2017). The population is mainly concentrated in the Red River and Mekong River delta as well as along coastal regions. Such geographical location and a large population create a foundation for expansion of manufacturing and trade, fostering economic prosperity.

Together with substantial trade and other policy reforms since trade openness, the Vietnamese economy in general and the manufacturing sector in particular have experienced many significant changes. Examination of changes is crucial to understand the relationship between trade liberalization and manufacturing performance. Moreover, analysis of macroeconomic condition is important to examine how the implementation of macroeconomic policy reforms has affected macroeconomic performance in Vietnam's transitional economy.

The chapter is structured as follows. Section 2.2 analyzes the key political reforms influencing changes in Vietnam's economy. Section 2.3 analyzes the economic reforms with emphasis on the trade policy, investment and foreign exchange reforms. The analysis in section 2.4 focuses on the detailed examination of changes in different aspects of economic performance in the light of different phases of trade reforms. Section 2.5 highlights the social performance responding to an era of trade liberalization. Finally, several lessons are presented in section 2.6.

2.2 Political reforms

With the victory of the August Revolution against the 80-year French colonization, Vietnam became independent on 2 September 1945, opening the period

of independence and freedom for Vietnamese people. However, only one year later, the French controlled Vietnam again until 1954. From 1954 to 1975, Vietnam was divided into two parts: the North being the Democratic Republic of Vietnam and the South being the Republic of Vietnam. After the 20-year war between the North Vietnamese army and the South Vietnamese forces, Vietnam was officially reunified and renamed the Socialist Republic of Vietnam in 1975.

During the post-war period, under the full application of the central command economy with state assertion of control over the entire country, the difficulties of the Vietnamese economy were exacerbated. The government nationalized the private sector and applied collectivization to agriculture. There was an agricultural production crisis, a growing external debt, no foreign investment and insufficient domestic financial resources for economic development (Arkadie and Mallon, 2003). There was also the lack of availability of basic goods and inflation was out of control. Moreover, a bureaucracy and the US's trade embargo blocked all market forces, meaning the economic situation became worse. The chaos had put the Communist Party of Vietnam under great pressure to pull the country out of the crisis, and Doi Moi (Renovation) policies at the Sixth Party Congress in 1986 were introduced. They aimed to transform the Vietnamese economy from a command economy into a market-oriented system intended to encourage foreign investment.

Following the introduction of the Doi Moi policy with a formal acceptance of the "multi-ownership and multi-element" economy, market-oriented reforms started with domestic trade and price liberalization in 1989. They included the removal of local trade barriers between provinces to make integrated markets in the whole country and the abolition of the dual price system[1]. The collapse of communism in the former Soviet Union and Eastern Europe exerted significant influence on the Vietnamese Communist Party to adopt market-oriented policies under Doi Moi.

In the early 1990s, a number of additional changes in legal reform were introduced. More important, the adoption in 1992 of a revised Constitution confirmed the state's role to "promote a multicomponent commodity economy functioning in accordance with market mechanisms under the management of the State and following a socialist orientation." (Vietnamese Constitution, art.15). The 1992 Constitution

[1] There were state and market prices (Auffret, 2005)

provides a basis for Vietnam to formulate and manage the import and export tax system as well as develop bilateral and multilateral trading relationships with other countries.

Also in the 1990s, Vietnam started a number of important steps to promote international economic integration and trade liberalization. Vietnam had made a significant number of negotiations on regional and bilateral trade agreements, which give better access for Vietnam's export goods to the new markets of its trading partners and open domestic markets to their goods at the same time.

The year 2000 began the period of Vietnam's deep economic integration and accelerated trade liberalization with a number of landmark changes and events to the policy regime. Each event had its own important effects on the overall reform process toward a market- based economy. However, the WTO has been considered as a landmark event leading to deeper international integration and more extensive trade and investment liberalization.

The reform process in Vietnam is a political process following the ideology that political stability is a prerequisite of economic development and the Vietnamese Communist Party remains the unique power (Riedel and Turley, 1999). Although the Vietnamese Communist Party still feared losing their monopoly on national issues, they gradually accepted the adoption of open policies to a free market model with a socialist orientation and one party rule. In fact, reforms were more likely to be the forces strengthening the Communist Party by the advantages of the gains from economic prosperity.

2.3 Economic reforms

As a transitional economy, Vietnam has been implementing the reform process, aimed at transforming the centrally planned economy to a market economy. It contributes to exploit the diverse resources of the country for vibrant economic growth. The strategy concentrates on developing a multi-ownership economy, attracting foreign direct investment and stabilizing the financial, monetary and banking systems (Nghi, 2010). As a result, the diversity of ownership structure in line with trade liberalization and the economic integration process has created a market structure in various economic activities with the trend of increasing competition (Harvie and Van Hoa, 1997).

This section focuses on the reforms implemented and examines how the WTO accession provides incentives and tools to further strengthen Vietnam's international economic integration.

2.3.1 Trade policy reform

In the context of a transitional economy, Vietnam has dramatically reformed its trade policy to be more liberal. The Vietnamese Government implemented various reform measures to engage in more and more agreements with trading partners. Table 1 presents some key changes in policies related to trade and investment in Vietnam from 1986−2012.

From the perspective of major changes in trade policy and major trade agreements, it may be possible to view trade liberalization as taking place in two major stages: (i) the pre-WTO from 1986 to 2006 and (ii) post-WTO since 2007 with extensive trade reforms and accession to the WTO.

Table 2.1: Major changes in trade and investment policies in Vietnam 1986−2012

1986	Doi Moi (the Renovation) Economic reforms begin
1987	Law on Foreign Investment launched
1988	Law on Import and Export Duties introduced import tariffs
1989	State monopoly of foreign trade eliminated
1990	Ordinance on Customs introduced
1992	Trade agreement signed with European Union (EU)
1994	Quotas introduced
1995	WTO Accession Working Party established Joined ASEAN and accedes to protocols of membership of AFTA
1998	Joined APEC Import-export license abolished
2000	US−Vietnam Bilateral Trade Agreement signed
2001	AFTA starts implementing CEPT plan
2002	ASEAN China free trade area Implementation of US-BTA begins
2003	Tariff-rate quotas introduced
2004	EU−Vietnam bilateral agreement on WTO Accession
2005	New Investment Law introduced
2007	Implementation of WTO's commitments begins
2008	Amended and Introduced Law on Enterprises Income tax, Law on VAT& excise tax
2010	State Enterprises Law 2003 abolished
2011	Chile−Vietnam Bilateral Trade Agreement signed
2012	Starts negotiations to join the Trans-Pacific Partnership Agreement (TPP) and the Vietnam-European Union Free Trade Agreement (VEFTA)

***Source**: Author's compilation based on WTO (2006) and relevant legal documents issued by the Vietnamese Government.*

2.3.1.1 Pre-WTO

Following the introduction of Doi Moi in 1986, the system of bureaucratic centralized management based on state subsidies was abolished and moved to a market

oriented economy. In 1989, reforms started with unifying the exchange rate and eliminating the monopoly power of the state sector on foreign trade activities. The local trade barriers between provinces were removed to make an integrated market in the whole country (Auffret, 2003). More important was the introduction of a detailed regulation set introduced to allow preferential tariffs in 1991. One year later, Vietnam signed the first preferential trade agreement with the European Union (EU), mainly related to garments and textiles. This is the first major trade agreement with Most Favoured Nation (MFN) status being granted to both sides. At the same time, the harmonized system of tariff nomenclature (HS) was introduced providing a basic for Vietnam to formulate and manage the import and export tax system as well as to develop bilateral and multilateral trading relationships with other countries.

In 1995, Vietnam joined the Association of Southeast Asian Nations (ASEAN) and became a member of the ASEAN Free Trade Area (AFTA). This organization has a large population of 580 million and GDP of USD-17,000 billion. This AFTA agreement was the start of trade liberalization on the multilateral basis with a systematic and scheduled plan to reduce trade barriers. The AFTA framework includes tariff reduction (under the Common Effective Preferential Tariffs − CEPT scheme), commitments to reducing and eliminating non−tariff barriers (NTBs) and custom valuations (Nguyen, 2011). From 1996, Vietnam commenced its implementation of the CEPT. In the 1996−1999 period, most tariff lines in a CEPT list were very low, ranging between 0 to 5 percent (Le, 2002). In 1995, Vietnam officially started the WTO accession process by submitting application for membership.

In 1998, Vietnam became a member of the Asia-Pacific Economic Cooperation (APEC), which is aimed at facilitating trade and investment among its individual countries' member through reducing various barriers to trade and investment. Although individual countries' commitments within the APEC framework are not binding, the commitments are considered to add pressure to the domestic reform process.

Since 2000, Vietnam experienced a period of deep economic integration and accelerated trade liberalization with a number of events in the trade policy regime. The United States−Vietnam Bilateral Trade Agreement (USVBTA) was signed in 2000 and became effective from January 2002. The implementation of the USVBTA provided Vietnam with some experience and credibility to move the accession process forward. The ASEAN-China Free Trade agreement (ACFTA) was signed in 2004 and became

effective from January 2006, promoting regional trade for greater benefits of each country. By an intense effort in both bilateral negotiation and improving policies and regulation, Vietnam became an official member of the WTO in early 2007. Joining the WTO is the culmination of Vietnam's continuous effort in international economic integration. With the WTO accession, trade liberalization has taken place at the widest scope ever with much more reduction of trade barriers (Abbott et al., 2007).

By 2007, after joining the WTO, some 60 trade agreements and 80 MFN tariff agreements had been effective between Vietnam and its trade partners, giving a better access for Vietnam's export goods to the new markets (Abrami, 2005).

2.3.1.2 Post-WTO

Within the WTO framework, Vietnam has step by step opened the domestic markets for trading with most member countries at the MFN level. The Vietnamese Government signed bilateral trade agreements with other WTO members based on WTO principles and regulations. These agreements require Vietnam to make more changes to its existing institutions and regulations to be more compliant with WTO rules including national treatment, trading rights and development of investment relations and business facilitation (Auffret, 2007).

Generally, as Vietnam becomes involved with a number of free trade agreements, the tariff structure of Vietnam has been rationally changed toward simplification and uniformity. Because the MFN tariff schedule dominates the tariff system, it can be used to investigate further the structure of the tariff system. Under the WTO, there was a dramatic fall in the MFN rate from 17.2 percent in 2005 to only 13.9 percent in 2007 and is set to remain stable at 13.4 percent until 2023. The average MFN tariff rates are still quite high relative to regional and bilateral average tariff rates (Figure 2.2). Meanwhile, the AFTA rates continued to fall slightly to a very low level of 2.4 percent. Therefore, it is clear that protection levels have been significantly reduced in line with Vietnam's accelerated international economic integration.

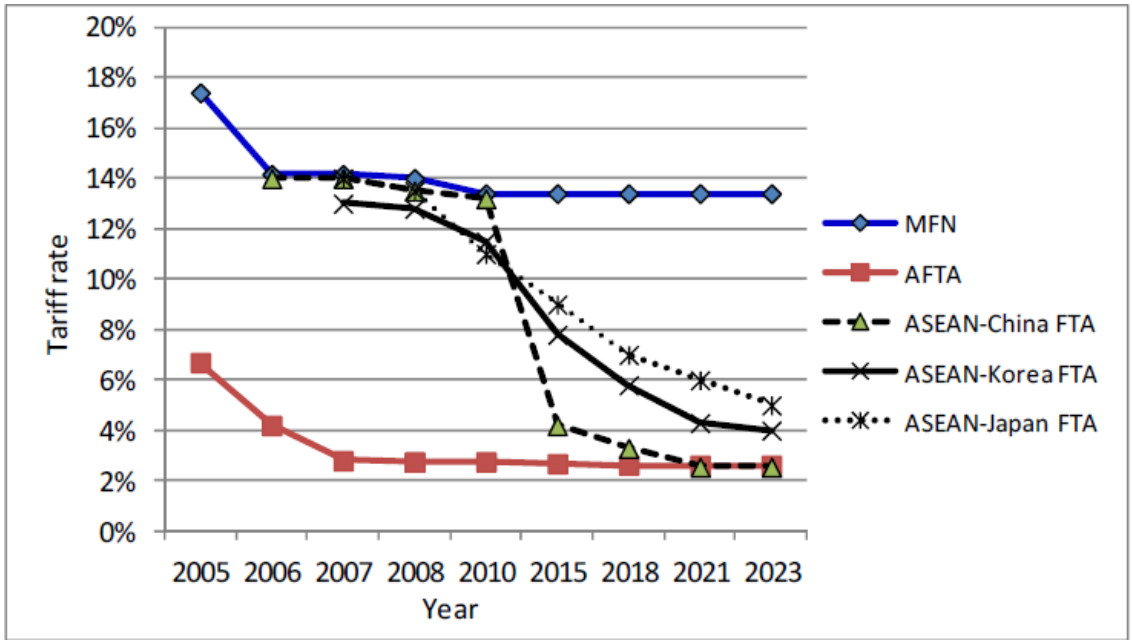

Figure 2.2: Tariff reductions in Vietnam: 2005−2023

***Note**: All tariff rates are bound rates*

***Source**: Truong et al. (2013)*

As a new WTO member, Vietnam agreed to comply with some sector-specific liberalization agreements. There are three sectors in which Vietnam has implemented by fully complying with rules and objectives of the WTO including Information Technology Agreement (ITA), medical equipment, and textiles. Under the ITA framework, approximately 330 tariff lines on information technology (IT) products are abolished after 3 to 5 years, maximum after 7 years. Also, there will be a dramatic fall in the committed tariffs for textiles and clothing. Besides this, Vietnam has partly complied with rules and objectives of the WTO in three sectors consisting of aircraft devices, chemicals and construction equipment.

Table 2.2: Average tariff of selected industries: 2005−2015

	Commodity groups	Number of tariff lines	MFN tariffs (%)	Bound rate at date of accession (%)	Final bound rate (%)
1	Agricultural products	1,219	23.5	25.2	21.0
2	Industrial products	169	16.8	16.1	12.6
3	Fish and related products	176	29.3	29.1	18.0
4	Oil and gas	37	36.0	36.8	36.6
5	Wood, paper	630	15.6	14.6	10.5
6	Textiles and garments	1,159	37.3	13.7	13.7
7	Leather products, rubber	341	18.6	19.1	14.6
8	Metals	1,201	8.1	14.8	11.4
9	Chemicals	1,579	7.1	11.1	6.9
10	Transport equipment	1,026	35.3	46.9	37.4
11	Mechanical machinery and equipment	1,436	7.1	9.2	7.3
12	Electrical machinery and equipment	766	12.4	13.9	9.5
13	Minerals	396	14.4	16.1	14.1
14	Other manufactured goods	723	14.0	12.9	10.2
	Entire tariff	10,689	17.4	17.2	13.4

***Source**: Authors' compilations from data collected from General Department of Customs.*

Vietnam had made binding commitments on 10,600 import tariff lines while acceding to the WTO. The average final bound rate will be 22.8 percent smaller than the average tariff rate from 2005-2015. According to Table 2.2 above, the commodity groups which have greater tariff reductions as Vietnam's commitments under the WTO framework were fully implemented are: textiles, fish and fish products, wood and paper, machinery and electrical equipment, leather and rubber, and some other manufactured goods.

In industrial products, the average final bound rate will be 12.6 percent compared to 16.1 percent at the time of accession and 16.8 percent before WTO accession. In agricultural products, the MFN tariff rate has been cut from 25.2 percent to 21 percent at the time of accession (equivalent 24 percent cut in general tariff level) within the five years after joining the WTO. There are four products, sugar, tobacco leaves, eggs and salts which Vietnam levies a specific tariff rate on the selective protection[2]. These in-quota tariff rates are the same as the current MFN counterparts

Generally, Vietnam has continuously made a great effort in conducting various reforms in legal and institutional frameworks and public administration. Therefore, a

[2] Decision No. 02/2006/QD BTM of the Vietnamese Ministry of Trade.

greater number of laws than ever before had been revised or newly issued such as the Civil Code, Commercial Law, Investment and Enterprise Law, Law on Intellectual Property, Ordinance on National Treatment and MFN, Competition Law, Ordinance on Antidumping, Ordinance on Countervailing Duties, and Law on Customs and Export-Import Duties (DAI 2008). Consequently, Vietnam's intense efforts in improving policies and regulations have led to its success of being the 150th member of the WTO since 2007.

2.3.2 Investment reform

Policies to attract investment from overseas have become important in most nations. In each stage of development, foreign investment policies need to be changed constantly to adapt to unprecedented movement in global FDI. The attractive FDI policies provide overseas investors with a stable business environment without incurring unnecessary risk (OECD, 2003). In Vietnam, the Law on Foreign Investment strongly affects the inflows of FDI. It is worth noting that from 1992 to 2000, there were important amendments of the FDI laws based on the first law on Foreign Investment issued in 1987. Moreover, the Vietnamese National Assembly unified the Law on Foreign Investment (LFI) and the Law on Domestic Investment Promotion to become the Law on Investment (the LI 2005) on 29 November 2005 and came into force on 1 July 2006 (Table 2.3).

Table 2.3: Events of investment reform, 1987−2005

Year	Events
1987	Law on Foreign Investment (LFI) adopted
1992	LFI revised
1996	LFI revised
2000	LFI revised
2005	New Law on Investment (LI) passed

***Source**: Author's compilation from GSO 2015.*

The first Law on Foreign Investment was passed in December 1987 and became effective from January 1988. It has been considered one of the important steps towards the Doi Moi policy, creating a legal framework more attractive and liberal for overseas investment entry in Vietnam. As a consequence, 560 FDI projects with USD 5.1 billion were established in Vietnam after five years of the LFI 1987 being in effect. There were three forms of overseas investment entry in Vietnam including business cooperation contracts, joint ventures and fully foreign-owned ventures. However, the LFI 1987

exposed some limitations in terms of the restriction of the forms of investment. Thus, The National Assembly of Vietnam amended the Law on Foreign Investment on 23 December 1992 (the LFI 1992). A distinguished feature of this revision is that the 'build operate-transfer contract' (BOT) is added as a new form of investment. These BOT contributes to the development of infrastructure in Vietnam.

The export processing zones (EPZs) have been developed in Vietnam as a policy tool for promoting exports and attracting FDI. The legal framework for EPZs was passed in 1991 in line with the law on export and import duties [3]. Firms in EPZs are provided with numerous incentives including domestic tax exemption, duty-free access to imported inputs, secure and easier access to land, and more efficient and reliable provision of power, water and telecommunications (World Bank, 2008). The special incentives for EPZs in Vietnam are considered to be more attractive than those offered in other Southeast Asian economies (Athukorala, 2012). Thus, EPZs have become the attractive environment for foreign investors, contributing significantly to FDI attraction. Vietnam as the host country has opportunities to absorb capital as well as access new technologies.

Since 1991, six EPZs have been approved and have made a considerable contribution to the national and local economy in terms of employments and export earnings. The export value of the EPZs increased from USD 758 million in 2001 to about USD 1,692 million in 2007. The total employment in EPZs amounted to nearly 125,000, accounting for 12 percent of the total labour in all industrial and export processing zones of the whole of Vietnam. The contribution of the EPZs in Vietnam appears to support the view that the EPZs have acted as an experiment and catalyst for further trade policy reforms and the overall market-oriented reform program as experienced in China (Madani, 2005).

The Law on Foreign Investment (the LFI 1996) was revised on 12 November 1996 by the National Assembly of Vietnam. It is considered an important step of the completion of a legal framework contributing to the attractiveness of the investment environment in Vietnam especially in remote areas with difficult conditions. The LFI 1996 allowed private enterprises to take part in joint ventures with foreign partners. In addition, the 'build and transfer contract' (BT) and the 'build-transfer-operate contract'

[3] Decision No. 978/1991 TTg

(BTO) were two additional types of investment.

In order to improve the business environment for foreign investors, the Vietnamese Government implemented another amendment to the Law on Foreign Investment on 9 June 2000 (the LFI 2000). These important amendments are the ease of entry and access to credit and land use as well as removal of obstacles in administrative procedures.[4]

The Law on Investment in 2005 is equally applied to both foreign and domestic investors and has simpler investment approval procedures (Athukorala and Tran, 2011). The elements of the LI 2005 relating to access to capital, investment protection, or spillover between domestic and FDI enterprises have been stipulated in a detailed manner. In addition, the LI 2005 also allows foreign enterprises to access loans from Vietnamese banks. It should be noted that these changes took place at the same time as the ongoing extensive trade reforms. Consequently, these accompany institutional reforms expected to result in more competition in the domestic markets for manufacturing firms. These are positive signs that Vietnam's legal system has been reformed to meet the actual development needs and the world economic integration trend is getting deeper.

Table 2.4 illustrates the overall progress of FDI projects and FDI flows to Vietnam over the period 1988–2013. During the first five years 1988−1992, the achievement of FDI attraction was limited with only 558 projects having a total registered capital of USD 1,004 million. In this period, FDI did not really influence the socio-economic situation. In the period of 1993−1996, FDI into Vietnam increased dramatically with 1,433 projects and a total registered capital of USD 9,088 million. This period can be considered as the beginning of the FDI boom in Vietnam. A decline in the number of FDI projects can be seen between 1997 and 2000. It was due to the impact of the Asian financial crisis in 1997. Vietnam's investment environment slowly improved compared with strong competitors like China. In the subsequent period (2001−2005), the flow of FDI into Vietnam began to slightly recover. As expected in the fundamental reforms of FDI-related policy in late 2005 and the context of WTO accession, the FDI flows have suddenly increased to approximately USD 65.7 billion

[4] The land-use rights could be used as collateral for borrowing from branches of overseas banks in Vietnam. The overseas investors could purchase foreign currencies for their payment transactions (Tien, 2010).

over the period 2006−2015 (Nguyen, 2015).

Table 2.4: Inward FDI in connection with the amendments of the Law on Foreign Investment

LFI and LI	Sub-period	Number of Projects	FDI (Million USD)
The LFI 1987	1988−1992	558	1,004
The LFI 1992	1993−1996	1,433	9,088
The LFI 1996	1997−2000	1,352	10,577
The LFI 2000	2001−2005	3,935	13,843
The LI 2005	2006−2013	8,625	65,670

***Source**: GSO 2015.*

It is worth noting that the promulgation of the Law on Foreign Investment in Vietnam has led to the rise of FDI inflows into Vietnam. It can be predicted that Vietnam will experience a large and increasing number of new FDI projects registered once various Vietnam's bilateral and multilateral Free Trade Agreements (FTAs) become effective.

2.3.3 Foreign exchange reform

In line with the broader economic reform process, the Vietnamese Government has implemented foreign exchange management as a significant instrument to regulate foreign currency flows. Vietnam's exchange rate regime has shifted from the multiple exchange rates to the single announced official rate based on a daily basic and the interaction of market forces (Thanh, 2010). The State Bank of Vietnam (SBV) is responsible to administer and implement the exchange rate policy. The Vietnamese commercial banks are allowed to quote their offer and bid rates within the 3 percent difference of the official USD/VND rate.

A general trend is that the access to the foreign exchange market has become easier in line with a more liberal trade regime. The balancing requirement set out in 1997 for foreign-invested enterprises indicates that the value amount of goods imported by these enterprises should be equivalent to the actual amount of foreign exchange they have brought into the country in the year (CIE, 2000). Since 2000, this requirement has been relaxed, making it possible for FIEs to buy foreign currency from domestic banks for debt and import payments to offshore banks (Athukorala, 2007). The relaxation of this requirement helped private enterprises to have formal rights to access domestic banks for their payment demands. As a response to the Asian financial crisis in 1998, the surrender requirement was imposed to gain current account stability. Under Decree 63/1998/ND-CP, all exporters were required to sell 80 percent of their foreign exchange

earnings to local banks within 15 days after transferring foreign currency funds to their accounts. This requirement was subsequently reduced to 50 percent in 1999, 40 percent in 2001, 30 percent in 2002 and finally eliminated in 2004.

However, in practice, only large firms, mostly State-Owned Enterprises (SOEs) have been favoured to get foreign exchange from state-owned commercial banks. Firms in the private sector still suffer from some restrictions on access to available foreign exchange for their payments of import transactions.

2.3.4 Ownership diversification

As a transitional economy, Vietnam has implemented ownership reform as a part of its institution reforms under the slogan "developing a multi-ownership economy" to provide incentives and exploit the diverse resources of the country for vibrant economic growth. The recognition of private property rights in the legal system provoked the ownership transformation process in the whole economy especially in the manufacturing sector. There are three main dimensions including reforming and reducing the state ownership sector, encouraging domestic private investment and attracting foreign direct investment. Consequently, the diversity of ownership structure has been developed in the whole economy as well as the manufacturing sector, in line with trade liberalization and the economic integration process.

Transition to a market-based economy entailed restructuring SOEs, which were dominant in the centrally planned economy and promoting the development of private sector enterprises. At the same time, the FDI policy led to the emergence and expansion of the FDI businesses in manufacturing activities. As a result, the increase in domestic competition in manufacturing was associated with the ownership diversification of manufacturing businesses.

The ownership reform process has created a market structure in various economic activities with the trend of increasing competition. As a part of the renewed reform process, the ownership reform process was speeded up in 2000 in line with the accelerated trade liberalization by the introduction of the Enterprise Law, which aims at promoting development of the private sector and a new phase of the state-owned enterprise reform. An impressive result was the striking response of the private sector with a large and increasing number of new firms registered (Nguyen, 2005).

Moreover, there was a close association between the pace of institution reforms

and resulting expansion of non-state enterprises, and the progress of trade reforms and international economic integration in Vietnam. The extensive trade reforms in the period 2000−2013 took place in line with the significant reduction of the SOEs, accelerated expansion of the private sector and the increased inflows of FDI into the economy.

2.3.5 Labour market reform

Before Doi Moi, the Vietnamese Government imposed strict regulations about employment and wage determination. All labour-related issues were regulated and implemented by administrative orders from the government plan. In the public sector, the specific wage for each type of job and payroll were predetermined by the government through the system of salary levels. The managers of SOEs had no influence on these decisions. In this period, the benefits of working in SOEs outweighed those in other sectors. The employees in SOEs were assured by social benefits and permanent positions. However, due to the lack of job availability in SOEs, there was a large proportion of informal workers existing in rural and urban areas. During this period, despite the minimum wage not recorded in labour law documents, the starting wage rate paid to workers with the lowest level and intensity of labour was still considered the legal minimum wage for each industry. Moreover, the lack of legal regulation led to the impossibility of labour mobility between firms.

In the period of transition from a centrally planned economy to a socialist-oriented market economy, the Vietnamese Government decided to abolish its control over job recruitment and wage setting. Thus, employees easily shifted from SOEs to other sectors and between geographic regions for better job pay and conditions, encouraging wider labour mobility in the economy. There was a rich labour supply for FIEs and enterprises specialized in exports. After the comprehensive Doi Moi was implemented in 1986, the living expense increase was much larger than the wage increase, forcing the Vietnamese Government to adjust wages (including the level minimum wage) with differences between regions and professions.[5]

The 1987 Law on Foreign Investment added Foreign Invested Enterprise (FIE) as a new economic component. Workers working in FIEs with higher job characteristics and professional qualifications should be regulated specifically for a

[5] Decision No. 147/1987 HDBT.

minimum wage to ensure fairness and to appreciate the value of labour. The minimum wage for workers in FIEs is 50 USD/month , applied over the period 1991-1995.[6]

Labour allocation in the public sector has been more flexible since 1986. Managers in SOEs have their own decisions on their recruitment not depending on the state plan. The labour contracts of SOEs employees were shifted from permanent to fixed-term positions.

The Labour Law of Vietnam[7] stipulates rights and obligations of employees and employers, considered as the legal framework and foundation for developments in the labour market. This Labour Law has implemented various reasonable principles such as: protecting rights and legitimate benefits of employees, ensuring the agreements of labour relations and facilitating public works and the union establishment. These principles promote the strength of labour forces and labour mobility, contributing to economic development with social progress. In addition, the Labour Law has integrated into international labour standards. It resulted from the practical demand in Vietnam as well as labour mobility in further globalization. The legal regulation provides measures for the Vietnamese employees working overseas and foreign workers in Vietnam.

In terms of wage determination, a market-based wage setting has replaced the state-assigned fixed wage schedule. Based on this, wage rates rely on employees' performance and business efficiency. Since 1993, the legal minimum wages system has been first established as a basis for wage rates for all employees. The minimum wage was regulated by regions and economic sectors (SOEs, FIEs). The wage gap between domestic enterprises and FDI has been significantly narrowed (Schmillen and Packard, 2016). Since 2009, the minimum wage set has only been different in four regions and there has been no difference among firms. This is considered as an inevitable result of implementing WTO accession regulations. The wage gap between domestic enterprises and FDI has been significantly narrowed (Schmillen and Packard, 2016).

Table 2.5: Minimum monthly wage in Vietnam, 2006−2014 (000 VND)

Year	Region 1	Region 2	Region 3	Region 4
2006	800 (1,200)	740 (1,080)	690 (950)	650 (920)
2007	980	880	810	730

[6] Decision No. 356- LDTBXH/QD issued on August 19, 1990.

[7] It was published in 1994, amended three times in 2002, 2004 and 2007

	(1,340)	(1,190)	(1,040)	(1,000)
2008	1,350 (1,550)	1,200 (1,350)	1,050 (1,170)	830 (1,100)
2009	2,000	1,780	1,550	1,400
2010	2,350	2,100	1,800	1,650
2011	2,700	2,400	2,100	1,900
2012	3,100	2,750	2,400	2,150
2013	3,500	3,100	2,700	2,400
2014	3,750	3,320	2,900	2,580

***Notes**: Region 1: Hanoi and Ho Chi Minh City. Region 2: Hai Phong, Dong Nai, Binh Duong, Ba Ria Vung Tau, Quang Ninh, Da Nang, and Can Tho. Region 3: Other provinces. Region 4: Bac Kan, Binh Phuoc, Dak Nong, Lai Chau, and Tay Ninh.*

The number in bracket is for FIEs

Since 2009, the minimum wage applied for all domestic firms and FIEs

***Source**: Author's compilation from Statistical Yearbook of the GSO.*

It can be seen from Table 2.5 that the minimum wage growth rate reaches above 20 percent in all four regions (Region 1: 24.7 percent per annum, Region 2: 23.9 percent per annum, Region 3: 22.8 percent per annum, Region 4: 21.6 percent per annum). However, these figures have been much lower than those of the neighbouring ASEAN-4 economies (Tongzon, 2008).

In conclusion, in the context of trade liberalization, the Vietnamese Government with its appropriate legal regulations has considerably contributed to the flexible mobility of labour and a productive workforce, forming a stable labour market.

2.4 Economic performance

The Vietnamese Government conducts macroeconomic policy reforms as a key aspect of the reform process in Vietnam. In general, Vietnam has been considered as being quite successful in maintaining a sound macroeconomic environment during the years of reform (World Bank, 2010).

2.4.1 GDP and economic growth

Economic reforms and opening to international markets have contributed to the impressive performance of Vietnam's economy. After unification in 1975 and throughout the 1980s, despite natural resources, Vietnam was suffering from a low economic base, inadequate such infrastructure and modest living standards, becoming one of the poorest countries in the world (Leung, 2010). In line with numerous policies and institutions, Vietnam has engaged in various bilateral and multilateral trade agreements. These moves led to the spectacular economic growth achievements

afterward. As an official member of trade preferences, Vietnam has opportunities to expand its markets and to attract international investors.

During the period from 2005 up to 2015, the Vietnamese economy has been relatively stable and maintained economic growth despite the impact of the global financial crisis. While economic growth in the world as well as the regions fluctuates strongly in difficult conditions of natural disasters, epidemics and fluctuations in world prices, Vietnam's economic growth rate is relatively high, averaging 7 percent annually, and only fluctuates in a narrow margin (World Bank, 2017). It could be considered an important achievement of the Vietnamese economy. Table 2.6 compares Vietnam's economy with other ASEAN countries in the period 2005−2015.

Table 2.6: GDP and GDP growth of Vietnam and other ASEAN countries, 2005−2015

	GDP (USD billion)			GDP per head (USD)			GDP growth rate (%)		
	2005	2010	2015	2005	2010	2015	2005	2010	2015
Brunei	5.60	9.43	10.66	16,849	25,754	26,486	2.6	-1.8	-0.4
Cambodia	3.77	6.24	10.35	294	452	692	5.4	5.0	0.2
Indonesia	151.07	284.78	546.84	774	1,294	2,363	3.5	5.9	4.4
Lao	1.72	2.85	5.57	323	508	911	5.8	8.3	7.5
Malaysia	88.01	137.96	193.12	3,664	5,280	6,820	0.6	4.6	6.6
Myanmar	6.93	10.98	24.96	135	197	418	10.4	4.4	4.7
Philippines	71.97	98.75	161.35	915	1,157	1,751	4.4	3.3	3.0
Singapore	87.71	125.41	192.71	21,618	29,400	36,632	2.1	3.7	6.2
Thailand	115.58	176.33	284.31	1,841	2,708	3,952	5.1	6.4	7.1
Vietnam	29.71	45.44	93.16	414	636	1,201	6.8	7.4	7.8
ASEAN	575.06	905.85	1,496.31	1,094	1,620	2,534	3.1	4.3	1.4

***Source**: World Bank DataBank, 2017.*

Rapid international integration and pervasive economic reforms have contributed to the impressive achievements of Vietnam's economy. This period witnessed the strong recovery of the Vietnamese economy from the crisis in the late 1980s. The GDP in 2015 was USD 93.13 billion, over three times of that in 2005. Moreover, the explicit enlargement of GDP per head from 1986 to 2015 revealed the improvement in the income of Vietnamese people. GDP per head was approximately USD 414 in 2005 and reached nearly USD 1,200 after 10 years. The average GDP growth increased to 7.4 percent in 2010 and to 7.8 percent in 2015.

Vietnam experienced a significantly faster economic growth in 2005−2015. Stimulated by accelerated economic integration and new waves of policy reforms, the large inflows of foreign investment and trading opportunities seem to have been the driving forces of the better economic performance. Vietnam's impressive economic growth was stimulated by the extensive liberalization of trade and investment regimes

with the highest share of foreign investment flows in GDP compared with ASEAN countries (World Bank, 2016).

2.4.2 Structural change

Institutional and domestic trade reforms helped Vietnam succeed in achieving substantial agricultural development in the 1990s. While being lower than other sectors, agricultural growth was relatively high by international standards. Moreover, sustained agricultural growth played a decisive role in political and macroeconomic stability (ensuring food security and keeping food prices low), export growth and poverty reduction (Mallon, 2005).

Table 2.7: The Vietnamese economy: growth and structural change, 2000−2015

	2000−2007	2008−2015	2000−2015
(a) Annual growth rate (%)			
Agriculture	3.5	3.6	3.7
Total Industry	10.6	11.1	8.9
Manufacturing	11.2	12.9	8.6
Services	6.2	7.2	7.3
GDP	6.8	7.4	6.9
b) Contribution to GDP (%)			
Agriculture	13.8	9.8	11.9
Total Industry	47.9	48.3	46.8
Manufacturing	28.1	32.0	27.7
Services	38.3	41.8	40.3
GDP	100.0	100.0	100.0
(c) Composition (%)			
	2000	2007	2015
Agriculture	22.4	23.3	16.1
Total Industry	32.4	35.4	42.3
Manufacturing	16.8	18.8	25.8
Services	12.1	41.3	41.6
Gross Domestic Product	100.0	100.0	100.0
GDP (billion VND at 2000 prices)	205,687	273,666	584,073

***Sources**: Author's compilation from GSO and the World Bank's Development Indicator Database.*

Table 2.7 presents the growth rates and structure of the whole Vietnamese economy and main sectors in different periods from 2000−2015. The effective stabilization policies and institutional reforms led to a strong expansion of all economic activities. As a result, with the annual average GDP growth of 7 percent during that period, the Vietnamese economy witnessed strong recovery from the crisis in the late 1980s with impressive growth rates in all economic sectors. The manufacturing sector had the highest growth rate, contributing to the better performance of the industrial sector compared to the rest of the economy in this period. The economy grew more rapidly with the continued leading role of manufacturing in 2000−2015. The

manufacturing and services sector had a similar increasing trend.

The continuous higher growth rates of manufacturing and the industrial sector has led to significant structural changes in the economy toward industrialization. It can be seen that manufacturing had a gradual and consistent increase in its share in GDP from 2000 to 2015. The average share of manufacturing in GDP increased from 16.8 percent to about 25.8 percent over the examined period. Consequently, by 2015, manufacturing overtook agriculture in the share of GDP. The industrial sector became the largest sector while agriculture accounted for the smallest share. The service sector experienced a mild gain in relative importance in the economy.

To some extent, the relative movements of manufacturing and agriculture indicate the quite rapid progress of structural transformation of the economy under the impact of the outward-oriented reform process. Vietnam appears to have experienced a more rapid pace of structural transformation than some Asian regional countries due to its faster trade opening in the context of globalization with the waves of trade and investment liberalization.

2.4.3 International trade

The initial steps of international economic integration appeared to foster Vietnam's external sector with the rapid growth of exports and imports. Figure 2.3 shows the trade performance for the period 2004−2015. During that period, it can be seen that the Volume of trade of Vietnam has increased rapidly, especially since becoming a member of the WTO in 2007. According to the trade statistics of the World Bank database, there was an increase in Vietnam's total value of merchandise export from USD 15 billion in 2004 to USD 114.63 billion in 2015, reaching an average growth rate of 20.2 percent per year in the period of 2004–2015. In 2012, the world experienced an economic downturn which led to a considerable fall in the prices of many commodities, especially primary goods. Consequently, the values of Vietnam's exports and imports fell slightly compared to previous years.

Figure 2.3: Trade performances, 2004−2015 (million USD)

***Source**: World Bank Data, 2017.*

Far-reaching trade reforms combined with WTO accession in this period appeared to have played an important role in promoting strongly the expansion of trade flows and hence the openness of the economy. There was a rise of Vietnam's total merchandise import value from USD16.1 billion in 2004 to USD 113.4 billion in 2015, as a result of the dependence on the imported material inputs and capital goods (Kokko, 2012). Due to improved world demand, particularly market access to the US, the total export value reached USD118 billion in 2015. Vietnam is currently the sixth largest export country in ASEAN, accounting for 0.3 percent of the world total. The trade deficit continued to be consistently reduced in contrast with the early years after joining the WTO.

Table 2.8 indicates that trade share as a proportion of GDP is plausible over the period. Trade measured in Volume increased significantly from around 19 to 135 billion USD. Importantly as a percentage of GDP it increased from around 76 percent to 145 percent showing the increasing relative importance of trade to total domestic production capacity.

Table 2.8: Trade shares of GDP and Trade deficits, Vietnam, 2002−2015

Years	GDP (USD billion)	Trade Volume (USD billion)	Trade deficits (% GDP)	Trade share of GDP (%)
2002	24.69	18.75	8.7	75.93
2003	26.89	21.36	12.9	79.43
2004	27.23	20.62	12.4	75.70
2005	29.70	23.29	8.2	81.13
2006	31.18	30.12	8.3	96.61
2007	32.52	31.24	20.1	96.06
2008	35.10	36.45	20.2	103.86
2009	39.56	45.41	12.94	114.77
2010	45.45	58.45	12.06	128.61
2011	52.93	69.21	8.14	130.75
2012	60.93	84.72	8.32	139.03
2013	71.11	111.33	7.72	156.55
2014	90.30	143.40	6.85	158.80
2015	93.17	135.30	5.92	145.22

***Source**: World Bank Database, 2016.*

There are several factors influencing imports volume in the period of 2000−2015. Firstly, Vietnam's products become relatively more expensive (in current VND) due to the appreciation of VND, leading to the import expansion. Second, FDI projects acquired the increased demand in imported goods. Additionally, higher demand for imported goods to serve domestic consumption and production continued partly as a result of the high growth rate of GDP (World Bank, 2015). The WTO accession in 2007 was associated with a dramatic rise in imports, partly as a consequence of a huge influx of foreign investment (Truong et al., 2013).

After the WTO accession, in the early years, the trade deficit expanded to a high level of 20.2 percent of GDP, nearly double the previous year's level. In the subsequent years, due to impacts of the global economic recession and policies to restrain trade deficit, the figure tended to be slightly reduced. During the period 2007−2015, Vietnam also experienced higher growth rate of exports to most markets (Table 2.9) by exploiting export opportunities in relatively new destinations and maintaining other traditional trading partners.

The export market has undergone major changes, shifting towards positive and diversified development. The new destinations are exploited and traditional markets are maintained. Europe was the largest importer of Vietnam goods with a proportion of 51.7 percent in 1990 but this figure dropped to only 24.3 percent in 2015.

Currently, the US accounts for the highest proportion of the total export value of Vietnam, Europe comes in second place and ASEAN is third place.

Table 2.9: The Vietnamese export structure, 2007−2015 (in current USD billion)

	2007	2009	2011	2013	2015
ASEAN	8.57	10.34	13.56	17.30	18.46
Australia	2.27	2.71	2.53	3.23	3.50
China	4.90	7.32	11.12	12.38	13.25
European Union	9.29	11.38	16.54	20.31	24.36
Japan	6.28	7.74	10.78	13.05	13.62
South Korea	2.05	3.08	4.73	5.57	6.61
United States	11.35	14.23	16.92	19.66	25.85
Total	57.21	69.81	92.87	110.78	126.64

***Source**: World Bank, 2017.*

The Vietnamese export structure by market has been immensely shifted by the bilateral and multilateral FTAs. As a member of the WTO, Vietnam can export to all 149 members within the WTO instead of several traditional markets with preferential tariffs. Thus, WTO accession will create new opportunities for Vietnam to take advantage of comparative advantages and solve obstacles in production procedures.

2.4.4 Foreign Direct Investment

International economic integration and trade opening take place in line with the attraction of FDI into the economy as a driving force of industrialization and growth. In the mid-1990s, around 30 percent of total investments in Vietnam came from businesses with FDI. The boom of FDI into Vietnam began in 2000, and since that year, the inflows have been growing dramatically year by year. This trend could be explained by the commitment of the Vietnamese Government in relaxing rules restricting FDI. Thus, Vietnam is considered as an attractive FDI destination for foreign investors (World Bank, 2013).

It is notable that there was a significant increase of the number of FDI projects from 4,267 projects in the period 2007−2015 to 6,837 projects in the period 2000−2006. However, implemented capital only accounted for an average of 33 percent of total registered capital in the years 2007−2015 (Table 2.10). It still increased but was outpaced by registered capital increase.

Table 2.10: FDI inflows to Vietnam, 2000−2015

Indicator	Unit	Before the WTO accession (1)	After the WTO accession (2)	Comparison (2:1)
		2000-2006	2007-2015	
Number of projects	Project	4,267	6,837	1.6
Total registered capital	USD million	29,582	152,686	5.2
Total implemented capital	USD million	15,501	52,531	3.4
Ratio of implemented capital over registered capital	%	51.4	33.0	

***Source**: Authors' calculations from GSO 2016.*

Overall, during 2000−2015, total implemented capital of the FDI sector tended to improve significantly despite the impacts of the global financial crisis and economic recession. Since 2001, numerous large high-tech projects and modern services including Intel, Nokia, Canon, Samsung and LG have been established in Vietnam, increasing the proportion of the FDI sector in industrial output value and export turnover. Within the recent 5 years, numerous large-scale projects with more than USD 1 billion in capital appeared in Vietnam. It allows Vietnam to become a place to produce high-tech products of the world such as smartphones and tablets (Trinh, 2014).

There was an increase in the contribution of the FDI sector to GDP from 16 percent in 2007 to 24 percent in 2015. On average, the FDI sector accounted for 19.1 percent of GDP in the period of 2007−2015, higher than that of 1.5 percent for 2000−2006. The FDI sector accounted for 70 percent of total exports of the country.

Foreign investors have operated in 19 out of 21 sectors in the national economic classification system. Although Vietnam has made policy adjustments to attract FDI to targeted sectors, FDI structure by sector has little changed in terms of the number of projects and registered capital. Throughout the 2005−2015 period, industry and construction were still the areas attracting the most FDI (Table 2.11).

Table 2.11: FDI structure by sector

Sector	Number of projects (%)			Registered Capital (%)		
	2005	2010	2015	2005	2010	2015
Industry and Construction	74.09	67.39	67.40	67.37	58.31	67.65
Agriculture-Forestry and Fishery	2.08	4.38	21.72	0.50	1.70	1.30
Services	23.83	28.23	10.88	32.13	40.00	31.06

***Sources**: GSO ,2008 , 2015, 2017*

Over the years, the industry and construction sectors accounted for more than 60 percent of the number of projects, registered capital and implemented capital. In particular, investment in industry made up a dominant proportion. In the earlier period, foreign capital flow was mainly directed to the mining industry and import substitution. However, in the period 2005−2015, this FDI trend has changed shifting into the processing, manufacturing and export-oriented industries. Meanwhile, the number of registered projects in the agriculture, forestry and fishery sectors is still limited, accounting for a very low share of total registered capital. Although these sectors are included in the List of Specially Preferred Areas, they are still less attractive to foreign investors (Ohno, 2016). The efforts of government to adjust policies are not enough to attract more FDI into these sectors. Thus, the result highlights that FDI inflows raise the country's economic integration, and immensely contribute to GDP growth and job creation.

It is worth noting that official development assistance (ODA) has recently supported Vietnam to successfully implement various important socio-economic development tasks. The year 1993 was set as a landmark from the day Vietnam began ODA from bilateral, multilateral donors as well as non-governmental governmental organizations (NGOs). ODA capital also has a close relationship with FDI capital in the direction of promoting FDI inflows, due to the spillover effects of ODA when focusing on investing in infrastructure, creating a favourable investment environment to attract FDI.

In order to improve economic efficiency and attract FDI capital, it is necessary to have ODA capital to advance to build socio-economic infrastructure, improve investment efficiency. The improvement of infrastructure requires time and a large amount of investment capital, while domestic investment cannot quickly improve and FDI requires a quick effect. Thus, attracting and maximizing the efficiency of ODA together with FDI attraction policies will help attract the necessary foreign resources for the need for fast and sustainable economic development.

Accessing to the WTO will promote ODA, especially from bilateral donors and non-governmental organizations. Through WTO principles, Vietnam has conditions to expand external economic relations with a range of international partners seeking economic benefits in relations with Vietnam. In a certain context, businesses are often interested in fulfilling their corporate social responsibilities through direct funding or

through NGOs to implement development projects.

ODA donor countries often have policies to support and incentive enterprises of the donor countries through the constraints of providing ODA in hiring consultants, selecting contractors ... Thus, competition between enterprises of donor countries will be higher, thereby giving an opportunity to improve the efficiency of ODA use. Up till now, Vietnam is still in the top 10 ODA recipients in the world (World Bank, 2015).

2.4.5 Macroeconomic stability

The period 2000−2015 was characterized by rapid trade openness. The government's consistent commitments to trade opening and other domestic policy reforms strongly encouraged foreign trade as well as private investment and foreign investment inflows. Vietnam's macroeconomic environment was more subjected to external sector performance and international markets. It was recognized that the government's management of macroeconomic stability has become increasingly sophisticated (Van, 2005).

2.4.5.1 Inflation

Vietnam's macroeconomic environment in 2001-2015 was more subjected to external sector performance and international markets due to rapid international integration (Mallon, 2005). Under the impacts of external economic shocks as well as domestic policies, inflation in Vietnam increased and later stabilized at one-digit level over the period 2001−2015 (Figure 2.4).

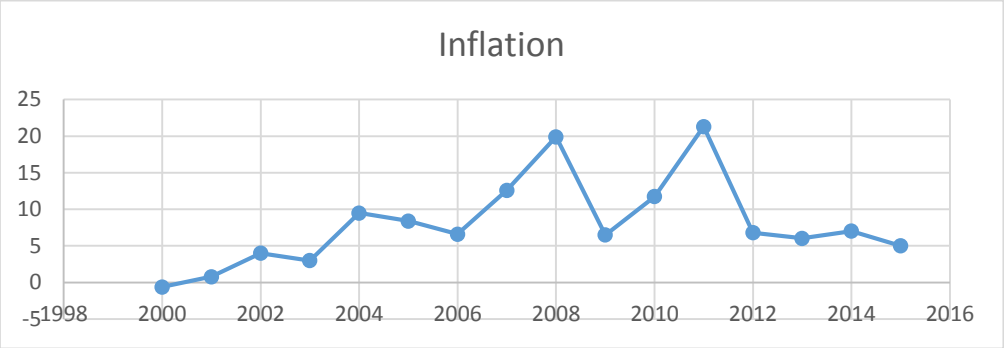

Figure 2.4: Vietnam's Inflation Rate, 2001–2015 (%)

***Source**: Author's compilation from the Yearbook of GSO.*

There was a surge in inflation in 2008 when the consumer price index growth quickly picked up to 19.9 percent. An underlying factor of this inflation was the rapid rise in investment and consumption, especially foreign investment inflow, due to very high expectation of foreign investors and consumers in responding to Vietnam's

accession to the WTO. The large inflows of foreign capital were a main cause of rapid money growth (Duong, 2010). In addition, supply shocks were thought to be one of the important causes of inflation in 2008, including the increases in food prices and world commodity prices (World Bank, 2012).

During 2008 and 2011, Vietnam had one of the highest inflation rates in Asia, averaging approximate 15 percent a year. According to many studies (Thanh and Duong, 2009; CIE, 2010), an increasing trend in inflation could be attributed to various reasons on both supply and demand sides. On the supply side, it was widely agreed that supply shock was a very significant factor in contributing to the surge in price levels. These supply shocks resulted from higher world prices of commodities such as steel, petroleum and other materials (World Bank, 2012). On the demand side, accumulated inflationary pressure from previous years resulting from high economic growth led to high inflation. Therefore, the impacts of international economic integration had exerted influence on the increase in inflation in the period 2007−2011. Since 2011, the government has also taken various measures such as reducing credit growth and other administrative measures to control the inflationary pressure. As a result, the inflation rate after 2011 is stable and stays at one-digit level.

In summary, in the pace of the process of international economic integration and trade reforms, Vietnam in general has successfully obtained inflation stability. It is worth noting that the low inflation rate was well maintained at approximately 5 percent from 2012 to 2015.

2.4.5.2 Exchange rate

Holding a relatively stable exchange rate is one of the government's objectives to control inflation. However, in the midst of the financial crisis, many ASEAN and East Asian countries devalued their currencies (IMF, 2000). Currency devaluation in neighbouring countries (Thailand, Indonesia, Malaysia and Philippines) led to the appreciation of the VND. Nevertheless, Vietnam's economy was less affected by the financial crisis (Nguyen, 2010).

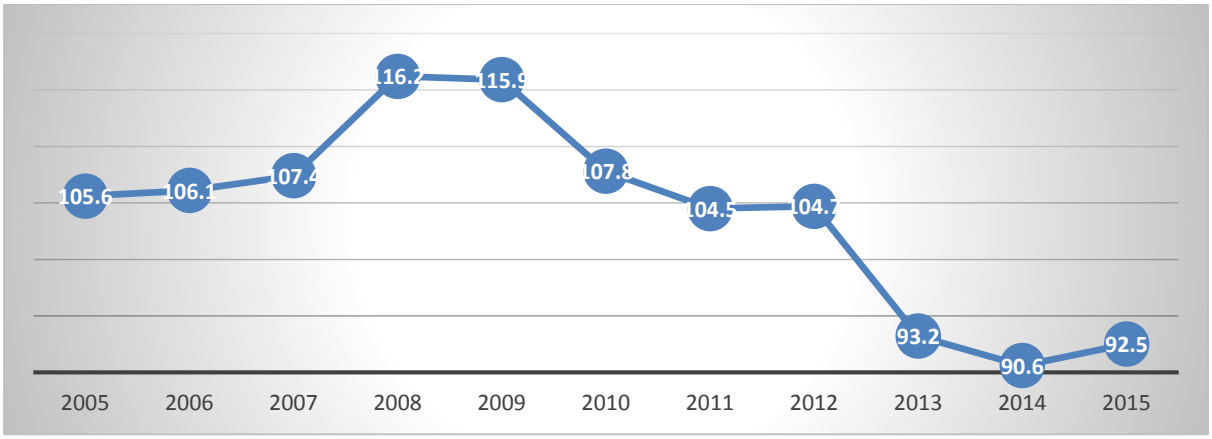

Figure 2.5: Real Effective Exchange Rate of VND, 2005−2015 (base year 2000 =100)

Source: *Compiled from various data sources of SBV*

Figure 2.5 illustrates the movements of real effective exchange rate (REER) in the period of 2005−2015[8]. As shown in Figure 2.5, between 2005 and 2008, REER increased (meaning appreciation of domestic currency) resulting a loss of Vietnam's competitiveness and deterioration of trade balance, and consequently inflation increased. In 2009−2015, when REER decreased (implying depreciation of domestic currency) with inflation reduced and stayed low, leading to a positive impact on trade balance. REER with the base year of 2000 (value of 100) rose from 105.6 in 2005 to 116.2 in 2008 then fell continuously to 90.6 and 92.5 in 2014 and 2015, respectively.

In summary, exchange rate movement with an impact on trade balance has been consistent with the inflation trend. The review indicates that Vietnam has successfully obtained a stable exchange rate to control inflation, transforming its economy from a centrally-planned economy to a market-based economy. It also reveals that economic reforms have been closely related to macroeconomic performance stability.

2.4.6 Employment and wages

In order to fully take advantage from free trade, Vietnam conducts various reforms on the labour market to create more jobs as well as improving the skills of the labour force. Along with a new era of deeper international integration, Vietnam's labour market has been gradually improved in terms of increased labour supply, improved wages, labour productivity and competitiveness of labour forces.

2.4.6.1 Employment

Economic reforms and opening to international markets have contributed to the

[8] REER can reflect a country's currency value relative to other currencies (Trinh, 2014)

impressive change in employment in Vietnam. Table 2.12 presents the growth rate of employment of the whole economy and main sectors in different periods from 2000 to 2015. The annual employment growth rate was highest in 2005−2010 at 2.7 percent compared with other periods, 2.0 percent in 2000−2005 and 2.1 percent in 2010−2015.

Since the agricultural employment growth rate was lowest at 0.8 percent during 2000−2015, a substantial growth of employment in services appears to be the main driving force of the overall fast growth of employment in the economy. The manufacturing sector had a remarkable employment growth rate, around 5.6 percent during the period 2000−2015, contributing to the largest employment of the industrial sectors compared with the rest of the economy.

Table 2.12: Structure and Average Growth Rate of Employment by Sector, 2000−2015 (%)

	2000−2005	2005−2010	2010−2015	2000−2015
1. Annual growth rate	2.0	2.7	2.1	2.3
2. Average employment growth rate				
Agriculture	2.0	1.2	-0.4	0.8
Industry	2.5	3.5	8.3	5.9
Manufacturing	2.9	4.1	7.4	5.6
Services	4.3	4.7	7.1	5.8
All sectors	2.5	2.3	2.8	2.6
3. Share in employment	2000	2005	2010	2015
Agriculture	65.1	57.1	49.9	42.3
Industry	19.2	25.5	30.5	32.5
Manufacturing	10.6	19.7	23.8	28.6
Services	15.7	17.4	19.6	25.2
All sectors	100	100	100	100
Total employment (‘000)	29,411	33,030	36,701	50,251

***Source**: Author’s compilation from GSO Online database*

The employment share of manufacturing was much lower than that of agriculture between 2000 and 2015. Moreover, agricultural employment dominated in 2000 and still accounted for nearly half of total employment. While this situation has been commonly observed in other developing countries (Sharma, 2013), it is notable that the pace of increase in manufacturing employment was significantly higher in 2015 than in 2000. This would suggest that employment impact of manufacturing growth was substantially different between the mentioned periods under the different trade policy regimes in Vietnam. A higher growth of jobs created by manufacturing firms was one of the important factors contributing to substantial reduction in national poverty (Dasgupta, 2010).

Unemployment decreased slightly after the WTO accession. The overall

unemployment rate of Vietnam went down from 2.47 percent to 1.95 percent in 2007-2014, compared to the rise from 2.1 percent to 2.3 percent in 2002-2006 (GSO, 2015). The world economy integration is likely to create opportunities to people seeking jobs.

In summary, the growth and structural transformation of the Vietnamese labour market have been closely associated with the pace of the policy reform and the country's trade policy regimes. In general, there has been a clear tendency to use more labour in manufacturing in the context of substantial trade reforms since 2000. Manufacturing with a higher average rate of employment growth has been a driving force of this transformation process after joining the WTO.

2.4.6.2 Wages

Opening to trade and foreign investment, facilitated through the globalization process has exerted influences on wage improvement. The average wage (at current prices) has been recently increased, reaching VND1.5 million a month per employee in 2013 and 2.7 million in 2015 (Table 2.12). On average during the period of 2007−2015, the wage of labour increased 15.4 percent per annum, which was equivalent to that of China. With the government adjustment in the regional minimum wage, the expected income of workers will be expected to rise in the next years.

In addition, the labour productivity growth rate increased slower than that of average wage. According to the current price, in the period of 2007−2015, the average wage per employee increased by 15.4 percent per annum, while the average labour productivity increased only by 13.9 percent per annum (GSO, 2010). This indicates that the increase in wages reflects the labour productivity improvement as well as the impact of the minimum wage adjustment policy.

Table 2.13: Average Wage and Labour Productivity, 2007-2015

	2007	2009	2011	2013	2015
1. Average wage, thousand VND/worker/month					
- At current prices	744	806	1,042	1,552	2,691
- At comparable prices	717	697	773	863	1,284
2. Average productivity, million dong/worker/month					
- At current prices	13,340	16,904	21,870	31,429	40,023
- At comparable prices	7,800	8,565	9,548	10,380	11,145
3. Price Index (2000 = 100)	103.8	115.6	134.8	179.8	209.6

Source: *Calculations from GSO.*

Therefore, in future, in line with modernization and market orientation, the labour market in Vietnam has been gradually improved in terms of increased labour supply, improved labour demand structure, improved income and wages. However, the labour market still has encountered some burdens leading to low competitiveness of Vietnamese workers including the shortage of highly qualified and trained workers, lack of effective training courses and low physical strength of workers. Against this background, the next section will carry out a closer examination of social performance in line with the policy reform process.

2.5 Social performance

Over more than three decades since Doi Moi, Vietnam has emerged as a transformed economy resulting from reforms and has experienced profound changes in society. Due to the high economic growth rate, stable prices and minimum wage adjustments along with the implementation of various poverty reduction programs, the living standards of the population in both urban and rural areas have been improved.

Table 2.13 illustrates the key social indicators. Conditions of access to basic living facilities provide a comprehensive picture of living conditions. The ability to access all basic social services of education and health as well as permanent housing, using electricity and clean water has tended to improve thoroughly. It presents the multi-dimensional improvements in all aspects of life in the period of 2000−2015. Housing conditions have been improved markedly. The proportion of households with permanent houses increased by nearly double after 15 years. In 2015, grid electricity covered most area in the country and was used by 98.6 percent of the population. Clean water has been widely upgraded with 92.5 percent of households accessing hygienic water sources.

Table 2.14: Key social indicators, 2000 – 2015

	2000	2005	2010	2015
Permanent housing (%)	27.8	49.2	49.7	51.3
Access to electricity (%)	83.4	93.4	97.1	98.6
Access to clean water (%)	75.2	90.5	91.3	92.5
Primary enrolment rate (%)	90.1	96.1	97.7	99
Literacy rates (%)	90.5	93.6	93.7	94.7
Poverty rate by income (%)	18.1	15.5	11.1	8.4
Gini index by expenditure	0.350	0.356	0.393	0.356

***Source**: World Bank, 2017.*

Programs on universalization of primary education have been promoted nationwide. In the period of 2000−2015, the primary school enrolment rate at the right age reached 99 percent and 63 provinces achieved the national standards for universal primary education. In the illiteracy eradication program, in 2014, nearly 95 percent of the population aged 15 and older knew how read and write.

The poverty eradication as a key priority of the Vietnamese Government has been continuously implemented. In the 16 years from 1993 to 2008, 43 million people escaped from poverty. The period 1990−2005 marked a rapid progress of poverty reduction. During this period, the poverty rate according to the national poverty line was reduced by a half. The overall poverty rate has decreased significantly from 18.1 percent in 2000 to 11.1 percent in 2010, and to 8.4 percent in 2015 (World Bank, 2017).

The value of the GINI coefficient is used to measure income inequality and reflects income distribution at the national level. The GINI coefficient reached the highest value in 2010, showing the highest level of inequality in living standards among regions. This phenomenon largely resulted from the economic decline in 2008, leading to many households falling into poverty. Since 2000, inequality in Vietnam has increased slightly over time but has increased less than other fast-growing economies such as China, Indonesia and Thailand (Athukorala, 2012). The income gap between urban and rural areas has remained larger. Poverty rates still differ between regions, or between ethnic minorities and the rest of the population.

2.6 Conclusion

In the context of a transitional economy, Vietnam has experienced sound progress in socio-economic development. This progress has been driven by various reform measures and fast-paced international economic integration initiated by the government. Recognizing the position of a developing country and the transition process, Vietnam has made continuous efforts in trade policy reforms and engaged in various bilateral and multilateral trade agreements. Vietnam became a member of such institutions as ASEAN, APEC, and the WTO. Meanwhile, Vietnam signed trade agreements with European Union, Japan and the United States, marking a crucial step in joining the global trading system.

This chapter has examined the key changes in the macroeconomic environment

in relation to the process of international economic integration. A key theme running through this discussion is the policy changes shifting toward more liberalization and transparency. The results of Vietnam's investment and trade policy reforms in accordance with international standards and WTO practices have made its trade regime and business environment more stable and transparent. Those results have had effects on FDI attraction and foreign trade expansion of the country as a driving force of industrialization and growth. Overall, there was quite a significant change in Vietnam's performance at the "dawn" of the WTO accession.

The next three empirical chapters will estimate and analyze the possible impacts of the WTO accession on the Vietnamese manufacturing sector, on firms' productivity, competitive selection and export participation.

Chapter 3

Trade liberalization in Vietnam and theoretical frameworks stylizing these facts

3.1 Introduction

This chapter discusses the experience of trade liberalization in Vietnam over the period 2000 to 2015 and reviews selected new trade theories and related empirical research of developing countries on trade and productivity. A conceptual model is developed which details channels of influences according to the theory and stylize facts. In particular, it emphasizes the possible impacts of trade liberalization on productivity and possible associations between exporting, importing and productivity.

The chapter starts with a survey of the dramatic reforms in Vietnamese tariffs. After that, it introduces some theoretical models and empirical research which provide background for a model which is used in determining the research questions and the following empirical chapters in the thesis. This rest of this chapter is organized as follows. Section 3.2 reviews trade liberalization in Vietnam over the 15-year period. Section 3.3 introduces related theoretical models for research questions in the thesis. Section 3.4 focuses on the framework for this study. Conclusions are drawn in the final section.

3.2 Trade liberalization

Trade liberalization accompanied by international economic integration in Vietnam has been a continuous and fast process. It took less than two decades for Vietnam to transform from a planned trade regime to being a WTO member in the beginning of 2007, from having almost barter trade relations with former socialist countries to having normal trade relations based on the international trade system (Pham, 2012). As a transitional economy, Vietnam's trade liberalization involved both transformation and reform of the regime in line with engaging in more and more agreements with trade partners.

Tariff reductions did not happen in the 1990s, reflecting the early transition feature of the trade regime. The year 2000 began the period of Vietnam's deep economic integration and accelerated trade liberalization with a number of landmark

changes and events in the trade policy regime. Apart from participating in multilateral frameworks of economic cooperation, Vietnam has also made a significant number of negotiations on bilateral trade agreements. By 2000, 57 trade agreements and 72 MFN tariff agreements had been signed between Vietnam and its trade partners (Trinh, 2016). Of importance are the MFN tariff agreements, offering better access for Vietnam's export goods to the new markets of its trading partners and opening domestic markets to their goods at the same time.

In the CEPT scheme for the 2001−2006 period, an increasing number of tariff lines were gradually lifted from 4,231 tariff lines in 2000 to 10,432 tariff lines in 2006. The average CEPT tariff rate decreased significantly from 7.2 percent to 2.45 percent in 2007. The tariff reduction under the CEPT scheme has resulted in a more liberalized trade regime in Vietnam for ASEAN imports.

The United States and Vietnam BTA (USVBTA) entered into force in December 2001 and has been considered as the most important among bilateral trade agreements. In this trade agreement, the main commitments are concentrated in three key areas: opening trade in goods and services, intellectual property rights, and investment. The USVBTA was expected to facilitate trade between Vietnam and the US through tariff reduction, market access and quota removal. Therefore, the USVBTA is considered as a stepping stone towards Vietnam's WTO accession.

By a great effort in conducting more bilateral negotiations with interested parties as well as speeding up various reforms in legal and institutional frameworks, Vietnam succeeded in becoming an official member of the WTO in January 2007. The accession to the WTO is expected to speed up trade liberalization in the light of MFN and improve market access for the new member country's exports, leading to an increase in trade (Abbott and Tarp, 2012). With WTO accession, trade liberalization has taken place at the widest scope ever with much more reduction of trade barriers. Vietnam's success in international economic integration means that trade protection would have been reduced considerably for the economy as a whole and the manufacturing sector in particular.

In the manufacturing sector, import tariffs were considerably reduced. As demonstrated by Figure 3.1, the average tariff of the total economy decreased from 17.3 percent in 1997 to 3.7 percent in 2007. Similarly, the average tariff of the manufacturing

sector declined from 27 percent to 3.7 percent (Trinh, 2014). Therefore, it is clear that protection levels have been significantly reduced in line with Vietnam's accelerated international economic integration.

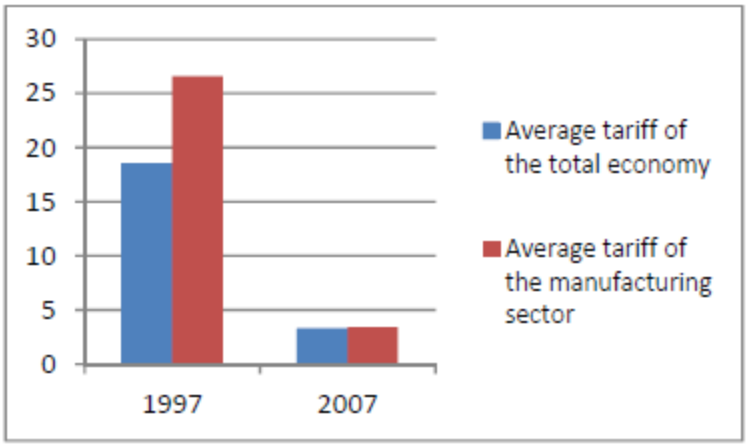

Figure 3.1: Import-weighted average tariffs, 1997 and 2007

***Source**: Trinh (2014)*

Under the framework of the WTO, there was a dramatic fall in MFN rate from 17.3 percent to 13.8 percent while CEPT and AFTA rates continued to fall slightly, but to a very low level of 2.5 percent and 4.2 percent, respectively (Athukorala, 2006). Therefore, it is clear that protection levels have been significantly reduced in line with Vietnam's accelerated international economic integration.

Vietnam also had extensive non-tariff barriers in the form of prohibitions, quotas and import licenses before 2000 to protect SOEs and import-competing industries by import substitution. Since 2000, the non-tariff instruments have been eliminated under implementation of bilateral and multilateral trade agreements. Non-tariff instruments consist of import licensing, quantitative restrictions, foreign exchange controls and custom procedures, influencing import inflows in Vietnam.

Before 1998, in order to enter into international trade activities, firms had to satisfy the list of demanding conditions on capital, experience and foreign trade contracts regulated by trade licenses. The set of difficult conditions hindered non-state enterprises only favoured the dominant role of SOEs in foreign trade activities. Decree 57/1998/ND-CP finally abolished the requirement of import-export licenses, creating an easy entry into international trading activities (Thanh, 2009). More liberal changes were made in 2001,[9] allowing all enterprises to enter foreign trading activities without

[9] Decree 46/2001/QD-TTg

any special regulations (Nguyen, 2010).

In addition, quantitative restrictions continued to be important non-tariff barriers in Vietnam in the late 1990s. The number of goods subjected to import quotas increased from 5 in 1995 to 9 in 1997 and 18 in 1999 (CIE, 2005). From 2000 to 2003, the use of import protection of the quantitative restrictions had been nearly abolished. It is worth noting that tariff quotas, a legitimate instrument under the WTO, were introduced in 2003 to replace the quantitative restrictions. Vietnam also conducted foreign exchange controls as an instrument to regulate import flows. Before 2000, the balancing requirement was set out. However, since 2000, the access to foreign exchange for import payments has become significant easier in line with a more liberal trade regime. Customs procedures with lengthy periods on clearing customs have continuously been considered as important non-tariff barriers in Vietnam. The obstacles have made firms spend lengthy periods on clearing customs procedures (Hai, 2007).

In common with many other developing countries, Vietnam has adopted an export promotion strategy as a way of exploiting comparative advantages and foreign exchange earnings for industrialization. Overall, trade liberalization in Vietnam has resulted in a more competitive environment in the domestic market in the following dimensions: making significant reduction of protection for import-competing industries, removing the barriers for import flows, and promoting various domestic reforms (WTO, 2012). These extensive and significant trade liberalization actions are expected to have profound effects on activity in the Vietnamese manufacturing sector. Theoretical models which stylize these actions, especially in terms of productivity and exporting activities, will now be considered to provide an analytic framework for the remainder of this thesis.

3.3 The firm heterogeneity models

The discussion of theories in this section of the study emphasizes their relevance, significance and links to the focus of the thesis. The models are selected from the new theory of trade, characterized by heterogeneous firms with differentiated products and productivities, operating in imperfectly competitive markets. These theoretical links between trade liberalization and the performance of the manufacturing sector contribute to provide rationales for the methodology and approaches followed in this thesis.

From a theoretical perspective of the new trade theory, in an open economy, firms are heterogeneous in terms of their productivity and size (Bernard and Jensen, 1999). It is heterogeneous productivity across firms that creates another gain from trade. Trade changes the composition of firms in an industry. More productive firms occupy market share at the expense of less productive ones, contributing to the increase in the average productivity of the economy. That is called a composition effect.

There are two mechanisms that can create a composition effect. The first mechanism is fiercer competition in the labour market as a result of trade (Melitz, 2003). Only more productive firms can deal with a range of fixed costs to enter an overseas market. The increase in demand for labour driving up real wages forces less productive firms to leave the industry. Consequently, the incumbent firms expand, contributing to the change in the composition of firms. The second mechanism is fierce competition in the product market as a result of trade, (Bernard et al., 2003, Melitz and Ottaviano, 2008). Reduced trade restrictions, together with strong foreign competition, result in the phasing out of less competitive firms in the market. The models differ in their structure to create this effect.

The Metliz (2003) model combines industry equilibrium featuring heterogeneous firm productivity with the assumptions of economies of scale, imperfect competition and differentiated products. One of the key contributions in favour of international trade is the reallocations between firms in an industry. The trade opening allows more productive firm to stay in the market and take over the market share of the least productive firms, leading to an increase in the industry's average productivity. Additionally, firms with higher productivity select themselves into the export market (Metliz, 2003). The study will adopt these approaches to examine the relationship between trade liberalization and firm productivity, given the focus on the manufacturing sector in Vietnam.

The Melitz model is different from earlier models in the sense that it specifically takes into account the presence of heterogeneous firms. The distinguishing factor between those firms is productivity. Companies that enter a new market are assumed unaware of their productivity, which is only revealed after the company has entered the market.

The model has two sectors, producers and consumers. Consumers are assumed

to have a CES utility function:

$$U = \left[\int_{v \in V} c(v)^{\rho} dv \right]^{1/\rho} \quad 0 < \rho < 1 \tag{3.1}$$

where V is a continuous set of product varieties indexed by v, $c(v)$ is the consumption of each product variety, v and ρ is the rate of time preference. The demand function of the representative consumer, associated with (3.1) is as follows:

$$c_v = \frac{p(v)^{-\sigma} R}{P^{1-\sigma}}$$

where $p(v)$ is the price of a variety of v, $\sigma = \frac{1}{1-\rho} > 1$ is the constant elasticity of substitution between any two varieties, R is income, and P is the price index, which from (3.1) is:

$$P = \left[\int_{v \in V} p(v)^{1-\sigma} dv \right]^{1/1-\sigma} \tag{3.2}$$

In this setting, each firm chooses to produce a different variety v. The production function requires just one factor, labour, L. Technology is inversely related to the total cost function:

$$TC(v) = f + \frac{1}{\theta} q$$

where θ represents the firms' productivity such that $1/\theta$ represents the marginal cost, f is the fixed cost (both are in terms of labour), and q is the total production of variety v. The profit maximizing price is assumed to be a constant markup $\left(\frac{\sigma}{\sigma-1} = \frac{1}{\rho}\right)$ over marginal cost:

$$p(\theta) = \frac{1}{\rho\theta} \tag{3.3}$$

The revenue of a firm with productivity θ is then:

$$r(\theta) = p(\theta) q(\theta) = p(\theta)^{1-\sigma} R P^{\sigma-1} = R(P\rho\theta)^{\sigma-1}$$

It is important to emphasize that the relative revenue of two firms with productivities θ' and θ''depends solely on relative productivity:

$$\frac{r(\theta')}{r(\theta'')} = \left(\frac{\theta'}{\theta''}\right)^{\sigma-1} \tag{3.4}$$

Transforming (3.4) gives

$$r(\tilde{\theta}) = \left(\frac{\tilde{\theta}}{\theta^*}\right)^{\sigma-1} r(\theta^*) \tag{3.5}$$

Profit can be expressed as a function of firms' revenue and cost:

$$\begin{aligned} \pi(\theta) &= r(\theta) - \tfrac{1}{\theta} q(\theta) - f = r(\theta) - \rho p(\theta) q(\theta) - f \\ &= (1-\rho) r(\theta) - f \\ &= \frac{1}{\sigma} r(\theta) - f \end{aligned} \tag{3.6}$$

Considering again the two firms with different productivities $\tilde{\theta}$ and θ^*, from (3.5) and (3.6) having:

$$\pi(\tilde{\theta}) = \left(\frac{\tilde{\theta}}{\theta^*}\right)^{\sigma-1} \left(\frac{r(\theta^*)}{\sigma} - f\right) \tag{3.7}$$

The equilibrium is characterized by a number M of firms and a distribution $\mu(\theta)$ of productivity levels and thus, in equilibrium, there will be $M\mu(\theta)$ firms with productivity θ. In such equilibrium, firms with the same productivity charge the same price, then the aggregate price in given by:

$$P = \left[\int_0^\infty p(\theta)^{1-\sigma} M\mu(\theta) d\theta\right]^{\frac{1}{1-\sigma}} \tag{3.8}$$

This can be written also as $M^{\frac{1}{1-\sigma}} p(\tilde{\theta})$, where $p(\tilde{\theta})$ is the price charged by a firm with productivity $\tilde{\theta}$, given by:

$$\tilde{\theta} = \left[\int_0^\infty (\theta)^{\sigma-1} M\mu(\theta) d\theta\right]^{\frac{1}{\sigma-1}} \tag{3.9}$$

where $\tilde{\theta}$ is a weighted average of the firm productivity levels and is independent of the number of firms, M.

Thus, $\tilde{\theta}$ presents aggregate productivity because it completely summarizes the information in the distribution productivity level, $\mu(\theta)$ relevant for all aggregate variables.

Given the aggregate variables price $P = M^{\frac{1}{1-\sigma}} p(\tilde{\theta})$ and quantity $Q = M^{\frac{1}{\rho}} q(\tilde{\theta})$, the aggregate revenue will be $R = PQ = Mr(\tilde{\theta})$ and the aggregate profit will be $II = M\pi(\tilde{\theta})$.

Further, note that $\bar{r} = \frac{R}{M} = r(\tilde{\theta})$ and $\bar{\pi} = \frac{II}{M} = \pi(\tilde{\theta})$, namely that average revenue and profit equals the revenue and the profit of a firm with productivity, $\tilde{\theta}$. Consider now a zero-productivity cutoff, denoted by θ^*, that is the productivity level associated with zero profits.

Equation (3.6) implies:

$$r(\theta^*) = \sigma f \tag{3.10}$$

Thus, firms with productivity $\theta \geq \theta^*$ make positive profits and firms with $\theta < \theta^*$ would make negative profits and therefore exit from the market. Thus, only firms with a productivity $\theta \geq \theta^*$ will be observed. It follows that active firms make positive profits in equilibrium. This is compatible with the free entry assumption, which implies that whenever expected profits are positive, new firms are willing to enter. Hence, an equilibrium with free entry must be associated with zero expected profits. This is possible only if entry is costly.

Assuming there are a large number of identical potential entrance firms, these firms prior to entry must make an irreversible fixed investment f_e (measured in units of labour), thereafter *sunk cost*, in order to learn its type θ, which is drawn independently from a common distribution, $g(\theta)$. $g(\theta)$ has positive support over (0, ∞) and has a continuous cumulative distribution $G(\theta)$.

The free entry condition implies that the expected profit must equal the sunk cost of entry. Formally, the sunk cost equals the average profit conditional on successful entry, $\bar{\pi}$, times the probability of drawing a productivity level greater than

θ^*. Thus f_e equals $1 - G(\theta^*)$, where $G(\theta^*)$ = Pr ($\theta < \theta^*$) = $\int_0^{\theta^*} g(\theta)d\theta$.

Thus

$$\big(1 - G(\theta^*)\big)\bar{\pi} = f_e \tag{3.11}$$

The free entry condition also implies a positive relationship between the average profit $\bar{\pi}$ and the productivity cutoff θ^*. This is because a rise in $\bar{\pi}$ leads to a fall in the likelihood of successful entry, in order to discourage entry in equilibrium. Thus, using $r(\theta^*) = \sigma f$, it can be expressed $\bar{\pi}$ as:

$$\bar{\pi} = \pi(\theta^*) = f\left[\left(\frac{\tilde{\theta}}{\theta^*}\right)^{\sigma-1} - 1\right] \tag{3.12}$$

As shown in Figure 3.2, in (θ, π) space, the free entry curve is increasing and is cut by the declining zero cutoff profit curve only once and from above. This ensures the existence and uniqueness of the equilibrium defined by $\bar{\pi}$ and θ^*.

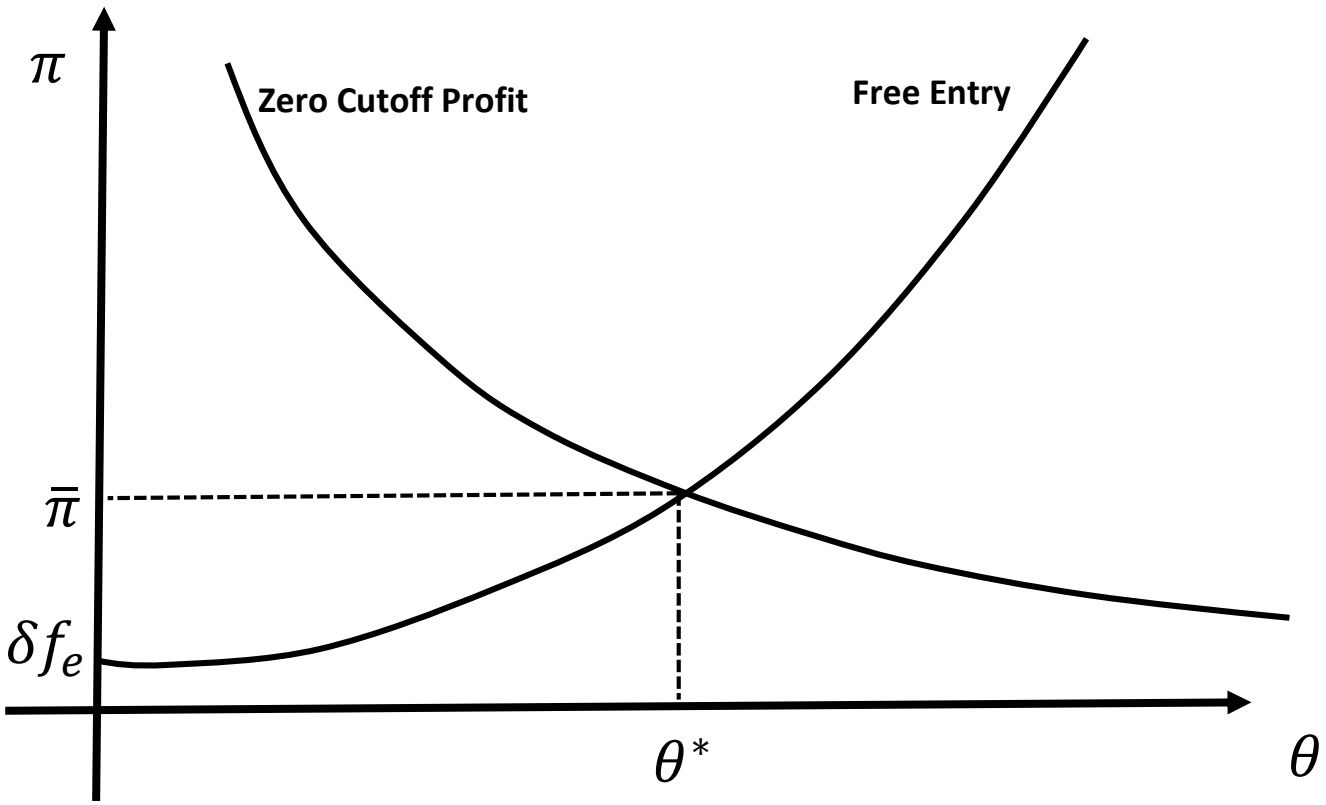

Figure 3.2: Determinant of the equilibrium productivity cutoff θ^* and average profit $\bar{\pi}$

***Source**: Melitz (2003).*

It is important to better explain the difference between the ex-ante productivity distribution, $g(\theta)$ and the ex-post $\mu(\theta)$.

$g(\theta)$ is exogenous and represents the probability of drawing any given productivity level upon entry. $\mu(\theta)$ is endogenous and is an equilibrium outcome and given that, firms with productivity $\theta < \theta^*$ do not produce. Hence, the ex-post equilibrium productivity distribution $\mu(\theta)$ is zero for $\theta < \theta^*$. Thus we have:

$$\mu(\theta) = \begin{cases} 0 & if \ \ \theta < \theta^* \\ \dfrac{g(\theta)}{1 - (\theta^*)} & if \ \ \theta > \theta^* \end{cases} \tag{3.13}$$

Using (3.13) it is possible to define the aggregate productivity level$\tilde{\theta}$ as a function of the cutoff level θ^*:

$$\theta^* = \left[\frac{1}{1 - G(\theta^*)} \int_{\theta^*}^{\infty} (\theta)^{\sigma-1} g(\theta) d\theta\right]^{\frac{1}{\sigma-1}} \tag{3.14}$$

This implies that average productivity is increasing in the productivity cutoff.

Using (3.14), it is possible to write (3.12) as follows:

$$\bar{\pi} = f\left[\frac{1}{1-G(\theta^*)} \int_{\theta^*}^{\infty} \left(\frac{\theta}{\theta^*}\right)^{\sigma-1} g(\theta) d\theta - 1 \ \right] = \left[\left(\frac{\theta}{\theta^*}\right)^{\sigma-1} - 1 \ \right] g(\theta) d\theta \tag{3.15}$$

Finally, using (3.15) into the free entry condition (3.11) yields:

$$f \int_{\theta^*}^{\infty} \left[\left(\frac{\theta}{\theta^*}\right)^{\sigma-1} - 1 \ \right] g(\theta) d\theta = fe \tag{3.16}$$

From (3.16) it emerges that the left hand side of such a relation, represents the expected value of entry and is monotonically decreasing in θ^*, because an increasing zero-productivity cutoff reduces the probability of successful entry. Thus, (3.16) uniquely individuates θ^* as a function of the model parameters, with θ^* decreasing in fe. In this setting, an increase in the entry cost, reduces entry and therefore allows less productive firms to survive. However, θ^* is increasing in the fixed production cost, *f*.

In this case, the intuition is that the average profit is proportional to the revenue of the marginal firm, which is increasing in *f* and θ^*. Thus, a higher fixed production

cost therefore requires a higher productivity for the marginal firm to break even.

In short, the model of Metliz (2003) tends support to the reasons why some firms export within industries and others do not. It is contracted from traditional theories of comparative advantages.

The models of Bernard (2003) are nonlinear and technical, and in order to specify and estimate these interdependencies, a conceptualization of the major influences will be helpful, particularly those relevant to a developing country like Vietnam.

Bernard et al. (2003) propose a model with CES preferences. Firm i can transform one unit of inputs w_i into $\varphi_i(\vartheta)$ units of variety ϑ. A firm i can sell goods k in the domestic market when the price of k is cheaper than other sellers.

$$\frac{w_i}{\varphi_{1i}} < \frac{w_k \vartheta_{ik}}{\varphi_{1i}} \tag{3.17}$$

In this case, firm i can sell goods k in the overseas market when the price of k is cheaper than other exporters are offering.

$$\frac{w_i \vartheta_{ni}}{\varphi_{1i}} < \frac{w_k \vartheta_{nk}}{\varphi_{1k}} \tag{3.18}$$

Because of the additional overseas shipping fees, the inequality in equation (3.18) is harder to achieve than in equation (3.17). Therefore, in order to serve into foreign market, firms must push productivity higher. Generally, firms with higher productivity will serve the foreign market; the others only work in the domestic market or leave the market due to their lower productivity level. This happens due to being exposed to trade increases.

The study of Bernard et al. (2009) plays a prominent role in international trade. The existence of multiproduct firms leads to the introduction of an extensive margin of product, which is likely to magnify the influence of firm heterogeneity in product quality and non-homothetic export behaviour. Such an implication is given by the fact that more productive firms might get higher profit by selling higher-quality products to higher income destinations. It follows introducing the extensive margin of product, strengthening the negative correlation between productivity and export intensity to low

income destinations, in general, the positive dependence of this relation on per capita income of foreign destinations (Arkolakis, 2008).

Another issue that could affect the relationship between export intensity and product quality is represented by the fixed costs of exporting. As argued by Eaton et al. (2014), these costs are mainly country-specific, leading most exporters to sell in just a few foreign countries. In Crino and Epifani's empirical work (2012), they make use of export data to broad destinations that generally include more than one country. Accordingly, considering multinational export destinations, they provide an extensive margin of countries that tend to reduce the negative correlation between productivity and export intensity to low income destination. Thus, firms with higher productivity may enter a larger number of countries within any destination.

The seminal firm heterogeneity model of Melitz (2003) became a standard platform for analyzing several international trade issues at the firm level. So far, international trade flows have been explained according to sector, country or firm characteristics. Several elements have been taken into account as main drivers of trade flows, such as technology, factors endowment, trade costs, GDP per capita and firm productivity. Furthermore, the increases in market competition in line with the trade openness promote higher quality goods. This tendency is considered a prerequisite for successful exports (Cantner and Kruger, 2011). This is an important issue especially for developing countries, since their economic development passes necessarily through a greater presence in the international trade markets.

In summary, an overview of the theoretical models in this section suggests that only the firms with the highest productivity could enter foreign markets and survive. Generally, exporters are likely more productive than non-exporters, implying the causality between exporting participation and firm productivity. As described in this section, the linkage among trade opening, productivity and exporting participation could be explained by these models. Thus, this study will apply this model structure and mechanism to explore the issues of Vietnam in the early stage of WTO accession.

3.4 Framework

The interdependencies can be studied by the channels through which trade liberalization influences firms. To identify different channels as the direction of effects in these channels is crucial. A review of empirical evidence from low and middle

income countries ensures that the correct channels and directions are identified for developing countries.

3.4.1 Productivity changes of individual firms

In the context of trade liberalization, the performance of the manufacturing sector in terms of productivity has a very significant impact on economic growth. The question arising here is how the manufacturing sector responds to the removal of trade barriers in developing countries. Figure 3.3 characterizes the different mechanisms through which trade opening affects firm productivity and exports participation.

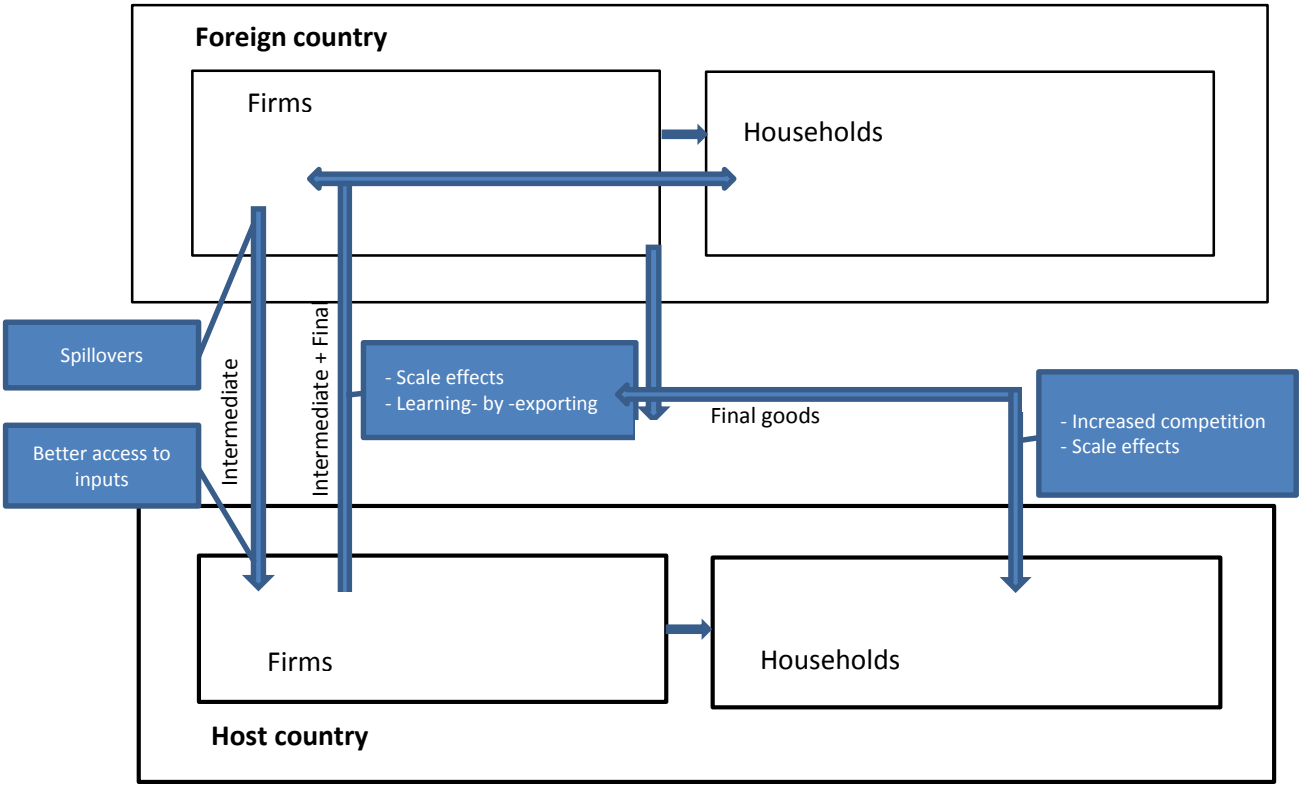

Figure 3.3: The conceptual model for trade liberalization mechanism

***Source**: Author constructed*

The conceptual model of Figure 3.3 illustrates the channels in which trade flows are affected by the reduction of trade protection. The host country is assumed as a developing country during the period of trade liberalization. The key difference between the host country and the foreign country is the initial gap in their current levels of knowledge. Another assumption is all firms in both countries are heterogeneous. The host country will import intermediate goods from the foreign country and export final goods as well as intermediate goods to the foreign country. Under the relaxation of trade barriers, the exporting and importing trade flows of the host country tend to

increase. The channels, which firm productivity in the host country is affected, are shown in the blue rectangles. The next section will describe each mechanism with empirical evidence.

Increased competitive pressure

Trade protection creates the high relative prices of import-competing goods, making it profitable for domestic producers. In addition, the empirical evidence suggests that the firms in many import-competing industries operate in a monopolistic environment with significant entry and exit barriers (Bhagwati, 1988). As a result, an overall net incentive is created for home market production in terms of monopoly returns. Under such circumstances, firms are not motivated to act optimally for survival because there are few threats from both foreign and domestic competition (Rodrik, 2000). As Bergsman (1974) indicates, trade restrictions allow inefficient domestic producers to stay in the market. Moreover, while it is possible that there are some efficient firms in the protected sectors, these firms appear to be reluctant to expand their market share due to the lack of competition pressures and thus accept supernormal profits and leave room for inefficient competitors. Overall, there exists a lack of motivation among protected firms. Tybout et al. (1991) claim that the absence of foreign competition makes domestics firms fail to produce at highest capacity level due to monopoly power. In addition, domestic producers enjoy high income both from trade protection and restricted competition without worrying about competition threats. That is why trade liberalization is often seen to be accompanied by increased competition.

Scale effects

The exploitation of scale effects through widened export markets is subject to a condition that manufacturing firms exhibit increasing returns to scale (IRS). The degree of IRS varies across manufacturing industries. Labour-intensive and raw material processing manufacturing industries seem to have less scope of IRS compared with capital intensive industries and developing countries tend to have comparative advantages in the former (Dijkstra, 2000). In this regard, scale effect with the decrease in output tariffs is an important aspect of potential growth of manufacturing sector and trade opening can have significant effects on a country's patterns of specialization (Pavcnik, 2002).

Improved access to inputs

The reduction in import tariffs on intermediate goods makes incentives for firms to import more goods and capital and expand their production scale. Before trade liberalization, the restrictions limit the availability of better and cheaper imported inputs, resulting in effective exploitation of technological possibilities (Dornbusch, 1992). Therefore, it is implied that underexploited capacity heightens the problem of resource underutilization, particularly the underemployment of unskilled labour, which is a main comparative advantage of developing countries. The productivity tends to increase due to the better access to imported intermediate goods and capital. The study of Sawchuk (2003) points out that lower input tariffs have positive effects on firm level productivity.

Learning-by-exporting

When trade integration between two countries is allowed, this creates the positive spillovers stemming from the foreign countries, which have comparative advantages of technology and knowledge. The term "learning by exporting" (Lash, 1998) indicates that exporting firms can be exposed to foreign technology and absorb the updated technology. Learning-by-exporting is considered as the process of exploiting the productive potential by developed technologies of their importing partners.

Under trading in foreign markets, the embodied technological knowledge is transmitted from advanced countries to developing countries. In their model of imitation, the product- specific technical information can be learnt and copied by domestic firms. While developing countries have some capabilities of invention, it is still more costly for them to develop new products compared with their counterparts with more research experience. Therefore, it is more feasible for developing countries to devote their resources to learning and adapting new technologies from abroad. Learning by exporting channels is expected to have only positive effects on productivity.

It can be concluded that trade liberalization has a likely impact on firm-level manufacturing productivity. Learning by exporting and spreading knowledge from imports are expected to have positive effects on firm productivity in the context of a developing country. The positive effects of increased competitive pressure due to output tariffs reduction tend to be smaller than that of better access to inputs and

technology generated by lower input tariffs.

3.4.2 Intra-industry effects

Trade openness might significantly influence the distribution of firms, resources reallocation and market share in an industry or sector. Due to the fact that firms have different productivity levels, the effects of international trade are not the same for firms within one industry. The comparative selection process from trade liberalization will phase out the least productive firms and the more efficient firms will occupy market shares from the exiting firms.

Under trade liberalization, the competition between firms leads to the reduction of costs, making the zero-profit productivity cut-off go up. As a result, more firms enter foreign markets. However, the least productive firms have to leave the market and more productive firms increase their exporting activities, leading to a reallocation of market shares and changes in aggregate productivity gain (Melitz, 2003).

The other theoretical channel generated from Melitz and Ottaviano (2008) is the toughness of competition which is affected by market size and trade will change aggregate productivity. By this mechanism, the least productive firm will withdraw from the markets.

Yalcin (2009) indicates that firms with the lowest productivity levels in a sector are forced to leave the market because of the increasing product and factor market competition. In Figure 3.4, firms with FDI experienced the highest levels of productivity. The exporting firms exhibit lower productivity, but higher levels than existing domestic firm. After trade liberalization, the zero-profit productivity cut-off has shifted to the right; as a consequence, the least productive firms leave the market.

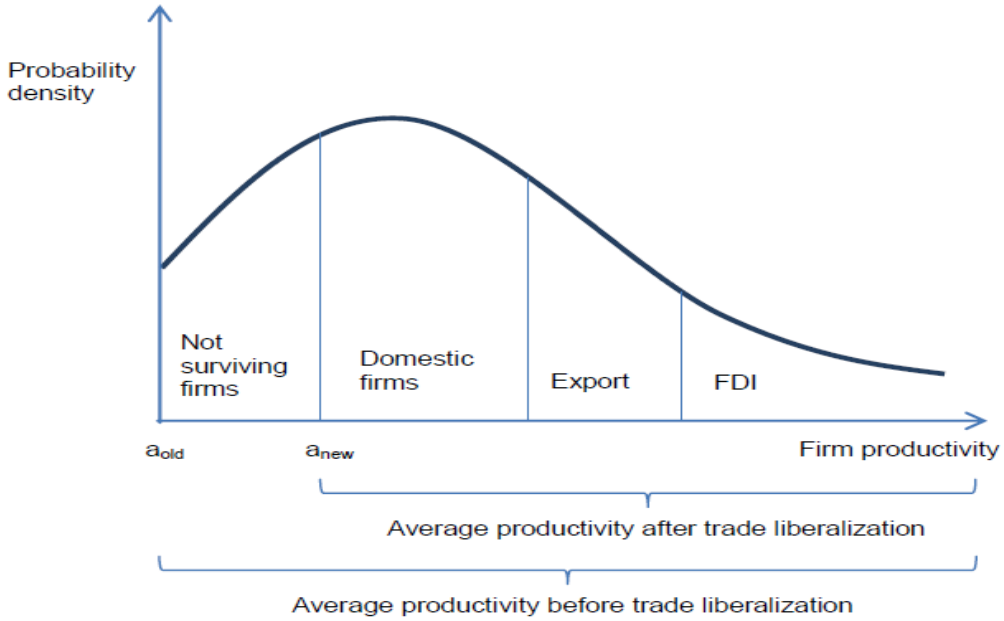

Figure 3.4: Firm distribution and productivity within a sector

***Source**: Yalcin 2009, Figure 1, page 172.*

It could be concluded that the increase in average productivity of a sector is due to selection and reallocation of market shares. Small-sized firms with lower productivity levels are more likely to be vulnerable to trade liberalization effects than large productive firms. Furthermore, sector productivity could increase if the productivity of existing firms goes up due to trade liberalization. Surviving firms can experience scale effects generated from exporting activities and market share reallocation.

3.5 Conclusion

Based on theories to identify and discern the main links through which trade opening may affect the productivity performance of domestic producers, this chapter set up a theoretical framework to explore research questions in this thesis. There are various mechanisms affecting firm performance consisting of fierce competition, better access to inputs, and learning-by-exporting. The selection processes will change composition of productivity growth and only more productive firms will continue to exist. In addition, exporters are expected to perform better than non-exporters and they exhibit higher productivity.

Motivated by the theoretical models and a review of empirical studies, this thesis will examine in the following chapters the impacts of trade liberalization and the associations between firm entry and exit, exports and productivity.

Chapter 4

Trade liberalization and total factor productivity

4.1 Introduction

The previous chapter reviews the extensive trade liberalization and domestic reforms in Vietnam's economy, including the manufacturing sector during 2007−2013. These reforms have resulted in a substantial reduction in manufacturing protection and an associated increase in competition in domestic markets. The expectation is that this would improve manufacturing productivity. There have been few notable studies on the positive linkage between trade liberalization and firm productivity that take into account firm differentiation (Rodrik, 1988; Rivera-Batiz, 1992; Krugman, 1996; Haskel, 2000; Winter, 2004). In contrast, a reduction in an output tariff leads to import competition in the final goods market, which could be a threat to domestic firms (Luong, 2014; Yang, 2016)

This chapter utilizes Vietnamese firm-level data to investigate the relationship between trade liberalization and the productivity performance of Vietnam's manufacturing sector. The data covers the years 2007 to 2013 when substantial trade liberalization took place.

The rest of the chapter is structured as follows. The next section provides a review of relevant empirical literature. Section 4.3 describes the methodology used to measure total factor productivity and the empirical model used to investigate the liberalization-productivity linkage. Section 4.4 provides preliminary results. A summary of findings and their policy implications is presented in the final section.

4.2 Literature review

A large amount of empirical studies is motivated by the theoretical models that examine the relationships between trade liberalization and productivity performance using various measures in both developing and developed countries. They can be categorized into macro-level data and micro-level data studies. However, the findings of macro-level data studies have been criticized because of the heterogeneity of countries and not accounting for institutional difference (Rodriguez and Rodrik, 2000). Moreover, macro- level data studies are limited in identifying the mechanism by which

trade openness affects productivity (Alvarez and Lopez, 2005). Therefore, micro-level data studies based on industry and firm-level data are important to explore the link between trade liberalization and productivity and can supplement macro studies. The standard approach to examining the impacts of trade liberalization on firm/industry productivity consists of two stages. In the first stage, firm/industry productivity is estimated. Next, a productivity equation is examined in which the correlation between trade liberalization variables and productivity is estimated.

One can see three major mechanisms in trade liberalization that can lead to productivity changes. This includes efficiency, economies of scale and technological progress. Also, empirical studies aggregate productivity at the industry level. Considering the above facts, this section explores empirical studies in this regard.

4.2.1 Increasing efficiency

Trade liberalization promotes efficiency through two channels. First, domestic firms face much more competition pressure from foreign ones (Corden, 1997). A closed trade regime with government import substitution policies creates monopoly returns for domestic firms. This market power creates disincentives for domestic producers to produce at the highest possible efficiency level. In addition, under such monopoly circumstance, firms are not motivated to act optimally for survival because there are few threats from foreign and domestic competition (Bhagwati, 1988). Moreover, the efficient firms in the protected sector appear to be reluctant to expand their market shares due to the lack of competitive pressures and thus accept leaving room for inefficient competitors. It is also argued that the absence of foreign competition means domestic firms fail to produce at the highest possible efficiency level due to monopoly power (Tybout et al., 1991).

Second, the removal of trade barriers could lead to cheaper prices of imported inputs with higher quality (Bergsman, 1991). Under trade restrictions, imposing a tariff is responsible for higher prices for imported inputs. However, under trade liberalization, there is a greater variety of resources with more reasonable prices. Firms utilize diverse resources with lower price and higher quality, reaching higher production and output with lower cost. Consequently, efficiency is generated.

Thus, when governments reduce trade restrictions, the flow of imported goods and the decrease in prices are usually expected (Bernard et al., 2004). The appearance

of foreign counterparts with advanced technology forces domestic firms to improve their efficiency by reducing production costs, in order to survive in the competitive market. Moreover, firms respond by adopting better available technology. Therefore, trade liberalization with foreign competition is considered as a motivational efficiency contributing to efficiency, as Leibenstein (1979) suggested.

Most macro-level studies have focused on examining direct correlation between trade openness and the economy's TFP growth based on country level data. However, macro-level studies have been frequently argued to have serious error measuring problems and economic shortcomings including endogeneity and misspecification (Hanson, 2001; Winter, 2007). Additionally, cross-country studies are limited because of serious measurement errors of trade policies originating from highly aggregate data (Harrison, 2005). In reviewing early studies on growth and TFP and openness among developing countries, Harrison (2005) concludes that country-specific studies seem to be more conclusive than cross-country studies. He also points out that studies based on plant-level data have helped to find out important and new stylized facts about the relationship between trade and TFP. Detailed case studies of each country based on micro-level data appear to have provided more specific empirical evidence on the links between trade liberalization and TFP.

4.2.2 Economies of scale

In the production theory, economies of scale refer to cost advantages obtained by a firm when expanding output down a declining long run cost curve. Since this is the locus of lowering short-run cost curves, it can be considered as contributing to TFP (Coelli et al., 2005). It is argued that trade liberalization provides domestic firms with better access to international markets for exports, which makes it possible for them to achieve economies of scale through expanding outputs (Coelli et al., 2005). Trade opening allows a country to exploit economies of scale by widening the markets for the goods in which that country has comparative advantages. Open economies are likely to specialize in a narrow range of products which they can produce and export at sufficient scale to be more competitive (Rodriguez and Rodrik, 2000). There has been a common hypothesis related to the "demand side" effect of trade liberalization on productivity, which essentially states that there is a positive relationship between export and output and productivity (Greenaway, 2004).

The distribution of output adjustment across different industries with differing

returns to scale affects the improvement in scale efficiency when being exposed to trade (Rodrik, 1992). Returns to scale tend to have more scope in capital intensive industries rather than in labour-intensive and raw material manufacturing ones. Economies of scale are more likely to appear in industries specializing in processing raw materials in developing economies.

4.2.3 Technological progress

Trade liberalization creates a wide range of opportunities for domestic firms accessing better technology from other countries. The diffusion of technology can take place via both import and export activities (Keller, 2010). Trade liberalization can generate productivity gains when domestic firms use imported intermediate inputs and machinery that are used for developing new products (Stone and Shepherd, 2011). Additionally, trade in goods can facilitate the exchange of ideas and knowledge through exposure to trading partners. For example, in order to satisfy foreign importers' requirements, exporters in the domestic market can learn from technical and managerial expertise from their counterparts, which can help to boost productivity (Park et al., 2010).

The development of the R&D sector is the driving force of technological progress. Trade opening can affect a country's rate of innovation by changing the cost of innovative activities through different mechanisms (Helpman, 1995). The most important mechanism is international knowledge spillovers, which can take place with international trade in three different ways: firstly general technical information is transmitted through the information exchange in commercial transactions, secondly innovative firms can obtain general technical information from imported differentiated intermediated goods, and finally local exporters can obtain lessons from foreign buyers by satisfying their requirement of product standards and information on product designs.

Generally, the flows of international knowledge increase with the volume of international trade of a country with the rest of the world. The knowledge flows contribute to increasing the country's stock of knowledge capital. Access to the larger base of knowledge capital helps the R&D sector to reduce the amount of human capital and hence the average cost needed to develop new differentiated products. Therefore, trade helps innovative firms to avoid replication of research efforts and then the world economy is able to achieve a higher rate of innovation with knowledge spillovers

compared with the case of technological knowledge progress without international trade.

In the case of developing countries, they lack a comparable technological capacity compared with industrial countries in terms of the size of their R&D sector and innovative outputs (Muendler, 2004). This would imply that it is more difficult for developing countries to develop their own new differentiated products by only benefiting from the general technological knowledge when it is internationally transmitted. Therefore, it is more important for developing countries to acquire new technical knowledge in order to upgrade their technological capability.

4.2.4 Industry-level literature

Moreira and Correa (1998) use import penetration and selected import ratios as measures of trade liberalization in Brazil and find positive impacts of them on manufacturing productivity for the period 1989−1996.

Using data on South Korean industry from 1966−1988, Chung (2000) applies the translog production function for industry-level data to find that trade protection has negative impacts on productivity growth. His study also shows that the contribution of TFP growth to output growth is about 3 percent. Ferreira and Rossi (2003) use industry-level data in Brazil during 1988−1990 to estimate TFP growth before and after trade liberalization. They find a negative relationship between trade protection variables and productivity growth. Minh and Long (2012) estimate that a reduction of one percentage point in the Nominal Rate of Protection (NRP) might increase industry productivity of the Vietnamese manufacturing sector by 0.4 percent in the period of 2000−2007.

Another study of Amiti and Konings (2007) is based on the panel data of 30 manufacturing industries in the period of 1980−1995 in India. It employs a “price wedge” between the domestic and international prices of each industry as a measure of protection and an index of intra-industry trade as a measure of access to foreign intermediate inputs, to investigate the impact of trade liberalization on Indian manufacturing TFP. The results show a significant impact of trade liberalization on Indian manufacturing.

Using industry-level data in the period 1990−2000, Ferreira and Rossi (2005) estimate the TFP of 16 Indonesian manufacturing industries before and after the dramatic trade liberalization by the instrumental variable (IV) method. They linked the

estimated TFP with nominal tariff, effective rate of protection and imports in a panel data regression framework. Their regression results reveal a quite strong impact of trade liberalization on the TFP of Indonesian's manufacturing industries.

Thus, in terms of industry-level data, a majority of studies find a positive relationship between trade liberalization and industry productivity. These findings are generally consistent with the theoretical predictions. Although studies using industry-level data are encouraging, firm level data permit investigation of the development of firm productivity over a longer time period.

4.2.5 Firm-level literature

There is a growing number of empirical studies using firm-level panel data to investigate the association between trade liberalization and firm productivity. Firm-level data allows analysis of trade liberalization impacts on firm productivity after controlling for other factors.

With the development of econometric techniques and increasing availability of data, the increased number of empirical studies has been fostered by the trend of globalization and the substantial trade liberalization episodes of many developing countries and transitional economies in Asia and Eastern Europe. Most empirical studies based on TFP have found statistically significant and positive impacts of trade liberalization in developing countries.

By removing the assumption of perfect competition in the traditional growth accounting approach to correct for bias in TFP estimates, Harrison (2005) examines the impact of 1989 trade reform on the performance of manufacturing firms in Cote d'lvoire. Using panel data estimation techniques and measures of tariffs and import penetration, the study finds that trade reform had a strong positive effect on firm productivity and resulted in some reduction of market power in term of price-marginal cost markups. With the same methodology applied to the firm-level data, Krishna and Mitra (2000) finds a strong competition effect and some positive productivity effect of the dramatic 1992 trade liberalization in India

Table 4.1 summaries the main findings of recent relevant empirical studies using firm-level panel data. These studies find evidence of a positive trade-growth nexus. The studies of Pavcnik (2002), Wong (2009), and Chan and Sen (2010), estimate the reallocation of resources and market shares from less to more productive firms result

in productivity growth. In addition, several studies (Muendler, 2004; Amiti et al. 2007; Fernandes, 2008) also evaluate the impacts of trade liberalization in terms of different characteristics of firms.

Table 4.1: Summary of empirical studies on trade liberalization and productivity at firm-level

Studies	Countries	Results
Pavcnik (2002)	Chile	Producers of the import-competing goods increased productivity by 3%−10% compared to the non-traded-goods sectors
Muendler (2004)	Brazil	A reduction of 10% in nominal tariffs leads to 1.3%−6.1% productivity gain
Amiti and Koning (2007)	Indonesia	A reduction of 10% in input tariffs leads to 4.5% productivity gain
Fernandes (2008)	Columbia	A reduction of 10% in nominal tariffs leads to 0.7%−2.9% productivity gain
Goldberg et al. (2008)	India	A reduction of 10% in input tariffs leads to 2%−12% productivity gain
Wong (2009)	Ecuador	A positive effect in export-oriented firms before 2000 but negative after 2000
Chan and Sen (2010)	Philippines	Trade liberalization leads to increased aggregate productivity due to the reallocation effect
Topalova and Amit (2011)	India	A reduction of 10% in input tariffs leads to 4.8% productivity gain
Ha & Kyota (2014)	Vietnam	Higher output tariff increases firm's TFP
Lileeva and Trefler (2010)	Vietnam	FDI generates economic externalities, enhancing domestic productivity

***Source**: Author's complication*

It has been found from these studies that trade liberalization still had significantly positive effects on firm and industry-level productivity through various channels such as foreign competition (import penetration, output tariff reduction), better access to intermediate inputs (reduction of input tariffs) and market share reallocation.

In Vietnam, substantial trade liberalization started in 2000 and reached a turning point in 2007 when Vietnam joined the WTO. Several significant sectoral studies have concentrated on what the changes of the trade policy regime imply for the performance of the Vietnamese manufacturing sector. However, only a few studies have directly investigated the links between trade liberalization and productivity of the manufacturing sector in Vietnam.

The study of Chu and Kalirajan (2011) is the first study that links firm productivity and trade liberalization. The study finds crucial evidence of the trade liberalization impact on manufacturing performance at the aggregate level. Moreover, manufacturing growth was found to be higher during the time of trade reforms and was the highest compared with other sectors, increasing its contribution to GDP growth.

The manufacturing growth appeared to be closely associated with the pace of import expansion. The best growth performance of manufacturing was accompanied by structural change toward export-oriented and labour-intensive growth, reflecting resource reallocation into activities in which Vietnam has comparative advantages.

Using the Levinsohn and Petrin (2003) methodology, Yang (2012) also examine the impact of trade liberalization on firm productivity in Vietnam. This study pays particular attention to the impact of ownership on firm performance, apart from considering common factors such as firm size, firm age, capital intensity, location and industry-specific characteristics. The findings support the arguments about the disadvantages and poorer performance of the private enterprises compared with SOEs and FIEs as well as for fair treatment in government policies.

A very recent study of Ha (2014) examines the determinant of TFP in the Vietnamese manufacturing sector at firm level for the year 2005, with particular attention paid to trade openness and export orientation. In this study, trade openness is measured by nominal tariff rates, import penetration and export ratios at manufacturing sub-sectoral level, while export orientation is based on whether the manufacturing firm is engaged in exporting or not. The study's findings are theoretically expected and robust among the measures of openness and the estimated coefficients in the stochastic frontier framework.

Although there are a vast number of empirical studies investigating the impacts of trade liberalization on firm/industry productivity in developing countries, studies that concentrate on the characteristics of a transitional economy from a centrally-planned to a market-oriented economy are very rare. In transitional economies, various measures related to economic and institutional changes have been comprehensively implemented. Thus, it is expected that trade liberalization would exert diverse influences on different industries at different rates. Moreover, there are only a few studies that link trade liberalization and the domestic competitive environment with the characteristics of firms.

The approach in this chapter is similar to that of those earlier authors, but with important emphasis on the endogeneity of trade liberalization. This chapter is different from other studies with a wider time frame and scope of coverage of our dataset including the landmark event in 2007 of accession to the WTO. The rich dataset makes

it possible to have a comprehensive investigation of the potential impact of the WTO accession on firms' productivity.

4.3 Objective, methodology and data

4.3.1 Objectives, hypotheses

The overall objective of this thesis is to investigate the effects of WTO accession on the performance of the manufacturing sector in Vietnam. To achieve this objective this chapter tests H4.1 and H4.2 hypotheses.

H4.1. Output tariff reduction increases firm-level TFP.

H4.2. Input tariff reduction increases firm-level TFP.

4.3.2 Data

4.3.2.1 Firm-level data

This chapter uses firm-level data from the annual enterprise census, conducted by the General Statistics Office of Vietnam (GSO) covering the post WTO period 2007-2013.

The enterprise census collects essential information on enterprises in all sectors of the economy including agriculture, industry and construction, and services. The information collected on firms includes main business activity, ownership, sales, profits, number of employees and income and compensation, assets and liabilities, investments and taxes by the end of each year. Each firm is coded by a tax number at the four-digit level of Vietnam's Standard Industrial Classification (VSIC). Using this tax code as a firm identifier, a firm-level panel dataset is constructed.

Data for manufacturing firms was filtered from the dataset based on an industry code according to VSIC 2007. All firms with fewer than 10 employees or lacking any key variables for firm performance such as output, employment, fixed assets and intermediate input cost are deleted.[10] This forms an unbalanced panel data at firm level for manufacturing sector for the years 2007 to 2013. The eligible observations for analysis have been reduced from 105,826 firms with 283,785 observations to 21,980 firms with 73,869 observations.

The general survey dataset is the main dataset used for calculating key variables

[10] The publication of the Decree 56/2009/ND-CP states that firms with fewer than 10 employees are defined as micro firms.

in the TFP equation. Real value added (VA) is based on the factor income approach, which determines the incomes of capital and labour separately and then combined these two components. The value added of each firm is defined as the sum of labour compensation and the capital rental payment. This component approach is employed in this study. The current price values of all valued variables including gross output, intermediate inputs and capital stock are transformed into the 2000 constant price values with appropriate price deflators at two-digit VSIV level. Nominal value added is measured using the addition method, in which the value added is the sum of the total labour cost, accumulated depreciation, operating profit before tax, and indirect taxes.

Labour input is measured in terms of the total number of employees getting paid. The sum of wages or salary, social insurance and other bonuses that employees receive represent total labour cost. Capital input (K) is defined as the net value of the fixed assets at the constant 2000 price in million VND.

Intermediate inputs are required for estimating TFP by the Levinsohn and Petrin (2003) technique that uses intermediate inputs as a proxy for unobserved productivity. The use of proxies corrects for the simultaneity between inputs and productivity in the firm's production function. In this study, intermediate inputs are calculated by subtracting gross output from value added at constant prices.

The use of panel data provides more observations and made it possible to examine the change of TFP over time under WTO accession.

Tables in the appendix provide the descriptive statistics of the variables used in the estimation equation.

4.3.2.2 Tariff estimation

Output tariff at the two-digit International Standard of Industrial Classification (ISIC) revision 3 is used from the World Bank's World Integrated Trade Solutions database. In this study, output tariffs are simple average effectively applied tariff of lowest applicable tariff for each of Vietnam's trade partners (Nguyen et al., 2017). Output tariffs data are available from 2007 to 2013. ISIC codes are matched with Vietnam Standard Industrial Classification codes (VSIC).

To compute input coefficients, Vietnam's Input-Output (I-O) Table 2012 at basic price constructed by the GSO in 2015 is utilized. The 2012 IO table consists of 112 industries, including 87 traded goods industries and 25 service industries. The

traded goods industries are grouped into three main sectors: agriculture, mining and manufacturing. This method uses tariffs on inputs in the estimation equation. Inputs tariff of industry k is a weighted average of output tariffs of all inputs in the production of a good in industry k. Output tariffs are import weighted tariff rates of industry j to produce a good in industry k.

Input tariffs are computed as:

$$inputtariff_{jt} = \sum_{k=1} a_{jk} * outputtariff_{kt}$$

where the coefficient a_{jk} is the cost share of input k in the production of output j, derived from the I-O table.

The calculation of input tariffs at basic price is also based on the I-O table.[11] Basic price equals producers' price minus production taxes. The output and input tariffs have been estimated for each industry group from 2007 to 2013. As reported in Table 4.2, the first line for each sector is the output tariff and the second line shows the input tariff.

Table 4.2: Average output and input tariff rate, by Industry and Year (%)

VSIC	Sector	2007	2008	2009	2010	2011	2012	2013
15	Food products and beverages	32.1 11.2	29.7 10.7	28.7 10.6	28.0 10.4	26.0 10.2	20.6 8.0	20.5 7.9
16	Tobacco	68.1 18.3	67.7 17.0	72.6 18.0	70.0 17.2	65.0 16.4	68.2 15.6	82.6 17.2
17	Textiles	29.1 17.5	28.5 16.2	27.5 15.6	27.6 15.7	27.9 15.9	9.3 6.1	9.5 6.2
18	Wearing apparel	38.3 20.1	37.2 19.4	35.1 18.6	34.7 18.7	35.8 18.9	16.9 6.7	17.1 6.8
19	Leather products and footwear	19.7 13.2	19.1 12.1	19.4 11.8	18.7 11.6	19.5 11.8	15.7 8.5	16.1 8.3
20	Wood and wood products	9.9 5.8	9.3 5.6	9.7 5.6	8.8 5.1	9.8 5.2	7.2 4.2	6.5 4.1
21	Paper and paper products	18.7 11.9	17.1 11.1	16.3 10.8	15.7 10.3	16.5 10.7	12.2 8.1	12.2 8.0
22	Publishing, printing	17.9 9.9	17.3 9.6	16 9.4	16 9.1	15.8 9.2	11.4 7.0	11.4 6.7
23	Coke, refined petroleum products	7.6 3.8	7.2 2.6	6.6 2.3	7.6 2.1	7.2 1.8	2.2 1.4	1.6 2.1
24	Chemicals and chemical products	4.5 3.8	4.2 3.6	4.2 3.7	4.0 3.9	4.1 3.5	3.2 2.7	3.3 2.6
25	Rubber and plastics products	15.8 11.3	15.1 10.6	15.1 10.4	13.9 10.3	14.2 10.6	11.9 4.9	11.2 4.8
26	Non-metallic mineral products	17.3	16.1	15.8	15.2	16.0	13.6	13.0

[11] There are three types of prices in the I-O table 2012 including producers' price, consumers' price and basic price.

		5.8	5.6	5.3	5.2	5.3	4.1	4.3
27	Basic metals	3.7 3.3	3.2 3.1	2.9 3.0	3.0 3.3	3.1 3.0	2.2 2.3	2.3 2.3
28	Fabricated metal products	15.6 4.5	15.5 4.2	15.2 4.1	15.1 4.0	15.1 4.0	11.9 3.1	11.6 3.1
29	Machinery and equipment	5.8 4.9	5.56 4.6	5.37 4.5	5.18 4.4	5.08 4.5	3.6 3.5	3.8 3.4
30	Office, accounting and computing machinery	5.9 7.7	5.7 6.9	5.5 6.2	5.4 5.7	5.3 4.2	3.6 2.7	3.0 2.1
31	Electrical machinery	12.3 4.0	11.4 3.9	11.3 3.8	11.0 3.7	10.9 3.5	10.7 3.4	8.0 2.7
32	Television and communication	10.7 4.5	10.2 4.2	10.1 4.2	9.3 4.1	9.5 3.8	6.8 2.2	6.6 2.4
33	Medical and optical instruments	3.5 3.4	3.4 3.0	3.3 2.9	3.2 2.9	3.0 2.8	2.4 2.3	2.4 2.0
34	Motor vehicles	28.7 7.8	26.6 7.6	27.9 7.5	26.7 7.5	26.8 7.4	16.4 5.4	17.7 5.6
35	Other transport equipment	24.7 7.3	23.1 6.8	24.1 6.7	19.1 6.4	19.7 5.7	18.1 4.3	15.1 5.1
36	Furniture and other manufactures	22.3 6.2	21.2 5.9	20.5 5.7	20.4 5.7	20.6 5.6	17.5 4.8	16.9 4.6

***Source**: Author's calculation from the data collected from General department of Customs.*

Taking a look at the manufacturing sector based on the Vietnam Industrial Standard Classification (VSIC) illustrates a different picture of tariff protection. The export-oriented VSIC industries including textiles, apparel, leather and footwear and furniture have the tariff protection level higher than others. Import-competing oriented industries such as non- metallic mineral products, motor vehicles and other transport equipment have experienced high tariff rates. The tobacco product industry has a very high and increasing tariff rate over the period 2007−2013.The group of industries producing intermediate inputs, machinery and equipment face a slower reduction of protection level compared with others. Firms have to pay tariffs on their material and intermediate inputs considerably higher than tariffs on their output.

The effect of the escalating tariff structure can be seen by comparing the input and output tariffs. Since 2007, a substantial reduction in tariffs is observed after the accession to the World Trade Organization.

It is notable that tariffs tend to be lower on intermediate manufactured goods than on final goods. It was found that the level of protection in Vietnam's manufacturing sector has been significantly reduced, particularly in the period of accelerated economic integration. In addition, the import-competing group appears to have experienced the largest reduction in protection level compared with other

manufacturing groups.

The estimated results of this section are the basis for the next sections, which aim to examine the impact of the reduction of the protection level and trade expansion on manufacturing performance.

4.3.3 Methodology

4.3.3.1 Measuring total factor productivity

The Levinsohn and Petrin (LP) approach is used to construct consistent TFP values, avoiding bias from the ordinary least squares (OLS) method due to time-invariant industry-specific effects. On the basis of the Olley and Pakes (OP) framework, a methodology using the intermediate input demand function to control for productivity shocks was developed. Assuming that TFP is exogenous and follows the first order Markov process:

$$\omega_t = E[\omega_t|\omega_{t-1}] + \zeta_t \tag{4.1}$$

That is, expected TFP, conditional on the previous period level, is realized with additional residual variation.

A more productive firm tends to use more intermediated input to obtain productivity gain in the future. Therefore, intermediate input demand is an unknown function of productivity and capital:

$$m_{it}^j = f(w_{it}^j, k_{it}^j) \tag{4.2}$$

with *t* is year, *i* is firm and *j* is industry

The inverted form of equation (4.2) with the assumption that m is monotonic in productivity, is:

$$m_{it}^j = f^{-1}(w_{it}^j, k_{it}^j) \tag{4.3}$$

In order to control for productivity shocks Equation (4.3) is substituted in the production function,

$$y_{it}^j = \alpha + \beta_l l_{it}^j + \lambda_{it}^j + e_{it}^j \tag{4.4}$$

where:

$$\lambda_{it}^{j} = \beta_k k_{it}^{j} + f^{-1}(m_{it}^{j}, k_{it}^{j}) \tag{4.5}$$

A two-stage estimation process is employed to construct the TFP measures. The first stage is to obtain the estimate $\widehat{\beta_l}$ and then the estimated $\widehat{\beta_k}$ is identified.

The estimates $\widehat{\beta_l}$ and $\widehat{\beta_k}$ are fitted into equation (4.6) to get the log of estimated TFP[12]

$$w_{it}^{j} = y_{it}^{j} - \widehat{\beta_l} l_{it}^{j} - \widehat{\beta_k} k_{it}^{j} \tag{4.6}$$

The model of the production in logs is presented as follows:

$$y_{it}^{j} = \alpha + \beta_l l_{it}^{j} + \beta_m m_{it}^{j} + \beta_k k_{it}^{j} + \omega_{it}^{j} + \varphi_{it} \tag{4.7}$$

with

y_{it}^{j} : log of output for firm i in industry j at time t

l_{it}^{j}: log of labour input

m_{it}^{j}: log of intermediated inputs

k_{it}^{j}:log of capital stock

ω_{it}^{j}: productivity of firm i

The demand function of intermediate inputs is given:

$$m_{it}^{j} = m_{t}^{j}(\omega_{it}^{j}, k_{it}^{j}) \tag{4.8}$$

Assuming that the demand function of intermediate inputs is monotonic in productivity, the inverted form of equation (4.8):

$$\omega_{it}^{j} = \omega_{t}^{j}(m_{it}^{j}, k_{it}^{j})$$

Equation (4.7) can be written:

[12] This research uses the Stata levpet command to get measures of TFP.

$$y_{it}^{j} = \alpha + \beta_l l_{it}^{j} + \partial(m_{it}^{j}, k_{it}^{j}) + \omega_{it}^{j} + \varphi_{it} \quad (4.9)$$

where $\partial(m_{it}^{j}, k_{it}^{j}) = \alpha + \beta_k k_{it}^{j} + m_{it}^{j} + \omega_t^{j}(m_{it}^{j}, k_{it}^{j})$

The equation for the second stage changes to:

$$y_{it}^{*j} = \alpha + \beta_m m_{it}^{j} + \beta_k k_{it}^{j} + E[\omega_t^{j} \,|\omega_{t-1}^{j}] + \vartheta_{it}^{*j} \quad (4.10)$$

The coefficients β_l, β_k and β_m in equation (4.7) will be estimated by two stages. In the first stage, $\beta_l$is estimated through equation (4.9). In the second stage, β_k and β_m are obtained from (4.10)

4.3.3.2 Determinants of TFP

After obtaining the log estimate of TFP, the following regression is used to estimate the impact of output tariff and input tariff on firm productivity:

$$\begin{aligned} ln\, TFP_{ijt} = \beta_0 + \beta_1 inputtariff_{jt-1} + \beta_2 outputtariff_{jt-1} + \beta_3 HFI_{jt} \\ + \beta_4 outputtariff_{jt-1} * HFI_{jt-1} + \beta_5 AGE_{it} + \beta_6 SIZE_{it} \\ + \beta_7 SOE_{it} + \beta_8 FDI_{it} + I_j + YEAR_t + u_i + v_{it} \end{aligned} \quad (4.11)$$

where

$ln\, TFP_{ijt}$: log of total factor productivity of firm i in industry j at time t.

$inputtariff_{jt-1}$ and $outputtariff_{jt-1}$:log of input tariffs and output tariffs for industry j at the time $t-1$ with a lag to accommodate that it take time for tariff reductions to affect firms' performance.

HFI_{jt}: log of the competition level of industry j measured by the industry's Herfindahl.

$outputtariff_{jt-1} * HFI_{jt-1}$: interaction term between logarithm of output tariff and logarithm of degree of competition in industry j at the time $t-1$

AGE_{it}: log of firm age variable denoted by number of years since the firm established.

$SIZE_{it}$: log of firm employment variable denoted by total employees of firm i at time t.

SOE_{it} :dummy variable for SOEs.

FDI_{it} : dummy variable for FIEs.

I_j: industry fixed effect.

$YEAR_t$: year fixed effect.

u_i : omitted factor affecting TFP.

All industry fixed effects in the estimation equation are included to control for the unobserved time-invariant firm characteristics that affect productivity.

Since the focus is on the impact of trade liberalization on productivity performance, trade policy measures are the central variables of interest in this chapter. One of the most common measures of trade policy is the use of tariffs. Reduction in tariffs is considered as a move toward trade liberalization and so this measure is used to investigate the impact of trade liberalization on industry performance. Both tariff variables are entered with a lag to accommodate that it may take time for tariff reductions to affect firms' performance.

In this study, the measure of trade policy incidence allows examination of the robustness of the impact of trade liberalization on Vietnam's manufacturing productivity growth. Given their interrelationships, the significance of the estimation results could indicate the consistency of the measure used to gauge the pace of trade liberalization in Vietnam. Since trade liberalization is perceived to be a reduction in trade protection, due to tougher import competition effects, it is expected a fall in the output tariff is positively correlated with productivity (Amiti, 2008). In addition, lower input tariff would boost productivity through imported intermediate input channel (Feenstra, 1994).

An important feature of Vietnam's transitional economy is the process of adopting market based principles. In line with the trade reforms, other domestic reforms, particularly the 2000 enterprise law, restructuring the SOE sector and banking system, and regulatory reforms have been implemented to reduce entry barriers and introduce market principles to all economic activities. While the outcome of these domestic reforms can be seen in different ways, such as the diversification of ownership and the increasing number of new firms, a central theme is increased competition within sectors or industries.

A common measure of competition used in empirical studies is the Herfindahl index, which takes into account both firm size and the number of the firms in an industry. Although this measure is commonly used in studies on other developing countries, it is particularly relevant for this study on Vietnam because most industries in transitional economies were highly concentrated with the dominance of SOEs in the centrally planned era (Cuong et al., 2010). This measure is commonly used in studies in other developing countries and it is particularly relevant for this study on Vietnam where most industries are highly concentrated with the dominance of SOEs from the centrally planned era.

The aim of the Herfindahl index[13] is to measure the outcome of the domestic reforms to be included in the model. The HFI is computed for 22 two-digit manufacturing industries based on the production data obtained from the annual enterprise census. The HFI shows the impact of some important institutional reforms in Vietnam since 2007, particularly the removal of entry barriers to business for the private sector and renewed SOE reform. These reforms were expected to promote more competition in manufacturing industries. As it is commonly suggested in the theoretical literature that more competition promotes and forces firms to be more efficient to survive in the markets, the coefficient on HFI is expected to be negative. It should be noted, however, that excessive competition (in terms of free entry and too many firms in an industry) could reduce performance due to diseconomies of scale (Zhang, 2001)

It has been observed that in many countries, the impact of trade liberalization is highly dependent on domestic conditions, particularly the domestic competition environment (Dijkstra, 2005). Therefore, given that both trade reforms were followed by domestic policy reforms in Vietnam, one of the proposed key hypotheses in this chapter is that the productivity impact of trade opening could be significantly influenced by the competition condition in manufacturing industries. To examine this hypothesis, the interaction terms, combining changes in output tariffs with change in industry competition level ($outputtariff_{jt} * HFI_{jt}$), are used to examine further the competition effects of output tariff reduction. The study of Amiti and Konings (2007) suggests that the industry concentration can affect the association between tariff

[13] The Herfindahl index $HFI_j = \sum_{i=1}^{n} \left(\frac{s_{ij}}{S_j}\right)^2$ where s_{ij} is the total sale of firm i in industry j with its gross output S_j.

liberalization and firm productivity. When the interaction term is added, the result indicates that productivity gain stemmed from tariff liberalization accrues only to more competitive sectors in Vietnam.

Similar to many other developing countries, the FDI inflows have been a driving force of growth in many sectors and industries in Vietnam since the FDI law and related policies have been put into effect. The FDI firms are often recognized to possess better technologies, know-how, management skills and access to foreign markets compared with domestic firms. This fact suggests that industries could obtain greater potential of productivity and output growth if the FDI firms play a more important role in their production activities. Therefore, the variable FDI is used to capture this effect on the industry productivity in the regression models.

The restructuring of the SOEs, a core part of ownership reform, is a prominent feature of Vietnam's transitional economy, particularly for the manufacturing sector. To some extent, SOE restructuring has contributed to fostering market competition by reducing the dominance of the SOEs and hence entry barriers to private firms. Moreover, as a key reason for restructuring, the SOEs sector has been recognized to have serious inefficiency problems due to the lack of competition pressures and management skills. In responding to these problems, all manufacturing industries have been involved in the SOE restructuring process. Therefore, the variable (SOE) is introduced into the regression equations to control for possible impact of the SOE restructuring process on industry productivity performance. Accordingly, this variable is expected to have a negative coefficient, implying that reducing SOE dominance could have a positive effect on industry productivity.

Firm size appears to be a commonly interested determinant of TFP as it is closely related to market structure and economies of scale. Larger firms are considered to gain more benefits than smaller firms because of their ability to exploit economies of scale. They have much better access to capital and technology (Lagos, 2006). This study uses the measure of firm employment with a dummy to be a proxy for firm size.

The age of each firm is calculated based on its foundation year. To some extent, the older firms are more likely to achieve higher productivity due to their experience.

The expected signs for the models' variables are shown in Table 4.3 below.

Table 4.3: Explanatory variables and expected signs of effects on TFP

Variable	Variable description	Unit	Expected sign
$inputtariff_{jt-1}$	Input tariffs	percent	-
$outputtariff_{jt-1}$	Output tariffs	percent	-
HFI	Herfindal index	Index of concentration	-
SIZE	Firm employment	Total number employed	+
AGE	Firm age	Number of years	+
SOE	State-owned enterprise	1 = yes, 0 = no	-
FDI	Foreign-owned enterprise	1 = yes, 0 = no	+

***Source**: The author's summary*

4.4 Empirical results

This chapter conducts the analysis with 73,836 observations for the period 2007−2013 reflecting WTO accession.

4.4.1 Total factor productivity

By using LP methodology, this chapter estimates the production function for each of 22 manufacturing sectors.

Table 4.4 presents the estimation of the production function (4.7) for each sector.

Table 4.4: Coefficients of the production function

VSIC	Sector	Capital	Labour
15	Food products and beverages	0.48	0.64
16	Tobacco	0.50	0.52
17	Textiles	0.40	0.63
18	Wearing apparel	0.21	0.71
19	Leather product and footwear	0.28	0.68
20	Wood and wood products	0.34	0.74
21	Paper and paper products	0.30	0.78
22	Publishing, printing	0.49	0.60
23	Coke, refined petroleum products	0.49	0.59
24	Chemicals and chemical products	0.60	0.49
25	Rubber and plastics products	0.42	0.66
26	Non-metallic mineral products	0.48	0.59
27	Basic metals	0.52	0.58
28	Fabricated metal products	0.41	0.69
29	Machinery and equipment	0.46	0.61
30	Office, accounting and computing machinery	0.45	0.62
31	Electrical machinery	0.49	0.58
32	Television and communication	0.60	0.47
33	Medical and optical instruments	0.54	0.59
34	Motor vehicles	0.51	0.58
35	Other transport equipment	0.49	0.57
36	Furniture and other manufactures	0.41	0.65

***Source**: Author's calculation based on GSO Database*

All industries register a lower capital coefficient than those for capital in all

sectors. On average, returns to scale of Vietnamese manufacturing firms have been increased with the computed scale elasticity [14] of 1.065. While most two-digit VSIC manufacturing industries have increasing returns to scale (the computed scale elasticity of higher 1.05), there are only two manufacturing industries obtaining decreasing return to scale including the garments and leather and footwear industry (the computed scale elasticity of less than 1.05). It indicates that a majority of firms in Vietnam's manufacturing sector are small- sized regarding labour and capital.

4.4.2 Determinants of TFP

Table 4.5 shows the correlation matrix of the independent variables used in this study, used to investigate the relationship between independent variables in order to avoid of the multi-collinearity. Overall, the correlation between variables is low but it is slightly high between input tariff and output tariff, which is 0.6617. After calculating for variance-inflation factor (VIF) to determine whether there are multi-collinearity problems, it is found equal at 3.05, which is less than 10, so the relationship between these variable is acceptable (Gujarati, 2003).

Table 4.5: Correlation Matrix of the Explanatory Variables

	Input tariff	**Output tariff**	**HFI**	**AGE**	**Size**	**SOE**	**FDI**
Input tariff	1.0000						
Output tariff	0.6617	1.0000					
HFI	0.1321	0.1465	1.0000				
AGE	0.0805	0.0437	0.0235	1.0000			
Size	-0.0178	-0.0129	0.0369	0.0425	1.0000		
SOE	0.2125	0.3189	0.0353	0.0146	0.0518	1.0000	
FDI	-0,1247	-0.1623	0.0282	0.0215	0.0919	-0.1037	1.0000

***Source**: Author's calculation based on VES.*

Table 4.6 presents the estimated results for 21,980 firms from 2007 to 2013 for equation (4.11). While output tariffs and input tariffs are the main variables; firm foreign ownership, size, age and the Herfindahl index are control variables. The estimation equation includes firm, year and industry fixed effects. To verify the robustness and condition of the impact of the trade policy variables on TFP with respect to domestic competition, the estimation was carried out with two alternative

[14] The scale elasticity is the proportional change in outputs resulting from an equal proportional change in all inputs in production at the same time.

specifications for each regression equation. In the basic specification (1), no interaction variable between trade and competition variables is included. In the full specification (2), all trade openness variables and their interactions with the industry competition index are included to capture the various links between trade and TFP.

Table 4.6: Tariffs reduction and firm productivity: Fixed effects estimators

Dependent variable: $ln\ TFP_{ijt}$		
Variables	Coefficients	
	(1)	(2)
$outputtariff_{jt-1}$	-0.0052***	-0.0106***
	(0.0041)	(0.0093)
$inputtariff_{jt-1}$	-0.0124***	-0.0278***
	(0.0026)	(0.0035)
HFI_{jt}		-0.1743***
		(0.0653)
$outputtariff_{jt-1} * HFI_{jt-1}$		0.0032***
		(0.0031)
AGE_{it}	0.0311***	0.0275***
	(0.0028)	(0.0031)
$SIZE_{it}$	0.0512*	0.0601*
	(0.0207)	(0.0316)
SOE	0.165	0.213
	(0.195)	(0.216)
FDI	0.304***	0.403***
	(0.131)	(0.161)
Constant	-0.153***	-0.971***
	(0.019)	(0.026)
N. of obs	73,869	73,869
R squared	0.646	0.646
Number of firms	21,980	21,980

***Notes**: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

***Source**: Author's calculation based on VES.*

The results in columns (1) and (2) indicate that the differences in TFP performance can be considerably explained by differences in the reduction in industry trade protection. The estimated coefficients for both tariffs are negative, statistically significant at the 1 percent level and consistent with prior theoretical expectations, indicating that a robust and significant impact of the reduction in trade protection on firm productivity after taking into accounts the possible effects of other productivity determinants.

The results in column (2) suggest that, holding other factors constant, firm productivity will increase by 0.0106 and 0.0278 percent respectively with a one percent reduction in output and input tariffs. The robust standard errors clustered by firm indicate both estimates are also statistically significant at the one percent level. This

result seems to be quite similar to the finding of Salim and Bloch (2009) for the case of the Indonesian manufacturing sector in the period 1995−2002 and the study of Topalova and Khandelwal (2011) for the case of India. Input tariffs always have a strong and statistically significant impact on productivity growth when incorporated in the estimated regression.

The estimated negative coefficient for the Herfindahl index in column (2) shows that firms in highly concentrated industries have lower productivity, consistent with Amiti and Koning (2007) and Fernandes (2008). To examine further the competition effects of output tariff reduction, the lagged interaction term between the output tariff with the Herfindahl index indicator is also included as it is possibly an important omitted variable. The positive and significant coefficient shows the combined effect of tariff reductions cause firm productivity to rise (inverse effect) and the firms in the more concentrated sectors experience a decline in productivity (inverse effect). The multiplicative effect is therefore positive, indicating that productivity gains accrue to more competitive producers of output goods in Vietnam. This finding confirms a theoretical prediction that industries with more competition could obtain higher productivity. This means that domestic policy reforms have generated a positive impact on the productivity performance of manufacturing sector. When the interaction term is added, the results indicate that firm productivity generally rises following tariff liberalization but the firms in the most concentrated sector experience a decline in productivity due to tariff reductions, implying that productivity gain stemmed from tariff liberalization accrues only to less concentrated sector in Vietnam.

As predicted in the literature, the estimated firm age coefficient of 0.0275 is positive and significant at the 1 percent level. This means that older firms tend to be more productive than younger firms, although it could also indicate that firms become more productive over time. This result seems to be consistent with the learning-by-doing hypothesis that firms with long time operation accumulate more market as well as managerial experience.

In addition, FDI attraction is considered a key element of the reform process in Vietnam. Thus, opening to trade and foreign investment facilitated through globalization process, puts emphasis on FDI orientation. As expected, the FDI dummy variable has a positive and significant effect.

The firm size estimate is significant at the 10 percent level, indicating a larger firm can obtain higher productivity. This means a larger size firm has an advantage and this is possible for manufacturing in an emerging country like Vietnam.

Ownership is a firm-specific feature in differentiating productivity in Vietnam. By obtaining the advantages of foreign technology and knowledge, FIEs seem to be more productive relative to SOEs with their incentive structure. The result is quite consistent with the claim made by Kokko (2012). Because of the differences in the way of transferring advanced technology and knowledge embodied in inputs, the impact of input tariff reduction on FIEs might be comparatively weaker than those of non-FIEs.

In summary, the findings support the evidence that trade liberalization has been found to have an expected and robust impact on increased firm productivity in the Vietnamese manufacturing sector.

4.5 Conclusion

This chapter investigates the possible effects of trade liberalization, via tariffs reduction, on firms' total factor productivity (TFP). The trade policy variables include simple average output tariff and input tariff, and tariffs interacted with the concentration/competition index. Major findings are twofold: first, lower output tariffs increase firms' TFP. Second, lower input tariffs cause a larger increase in firms TFP. This finding is consistent with literature on international trade and firm productivity. The empirical evidence shows that Vietnam has benefited from reducing output and input tariffs.

FDI also has had positive effects on firms' TFP indicating the Vietnam Government should create a favourable investment environment to attract FDI and consequently contribute to productivity for domestic firms. The move to international integration and trade liberalization has benefited Vietnamese manufacturing.

By joining the increasing literature on trade and firm heterogeneity, the study might have important implications for policymakers in designing appropriate policies without any strong opposition during trade agreements negotiation. The evidence presented in this chapter supports the theoretical positive effect of trade liberalization following Vietnam's WTO entry in immediate seven years on TFP. Reduction of protection is associated with higher firm productivity over time. The trend could be

attributed to the direct competition effect of trade liberalization. This will be done in the next chapter in terms of researching new dimensions relating to productivity differentials across manufacturing firms and firm turnover.

Chapter 5
Firm turnover and productivity growth in the Vietnamese manufacturing sector

5.1 Introduction

The absence of well-functioning markets has been considered to be one reason for the poor performance of the manufacturing sector in Vietnam prior to reforms. Consequently, liberalization has been the major component of the reforms that have been taking place in Vietnam since the 2000s. Vietnam has also made a transition from a command economy to a market oriented one. The assumption of free entry and exit of firms appears more relevant to the reality of developing countries under trade liberalization. It is argued that foreign competition will increase the average production by forcing some inefficient firms to leave the industry and the incumbent firms expanding to become more efficient (Rodrik, 1992).

The competition selection process occurs as new start-up firms are created and some existing firms close down. Consequently, the empirical literature of firm dynamics and productivity differentials has increasing accumulated. The first formal model relating firm productivity differentials to a process of natural selection came from Jovanovic (1982). Under this model, whilst firms with low costs exist and expand, firms experiencing higher costs leave the market. The model also predicts that firm survival is expected to have a positive relation to firm age and size as the consequence of competitive selection processes. Motivated from the theoretical study of Jovanovic (1982), there is increasing interest in observing the dynamics of firms in manufacturing industries. However, there are very few studies considering this issue, focusing on an economy that is in transition from a centrally planned to a market economy.

Vietnam's manufacturing sector appears to be relevant for examining - the productivity effects of entry and exit - in the context of numerous reforms moving toward a liberal trade regime. Since the 2000s, the pace of reforms has been accelerated to WTO accession in 2007 and the country has left the import substitution regime in favour of an export-oriented growth strategy. In this period, comprehensive reforms have been launched in every field of the economy to enhance efficiency, international competitiveness and dynamism to promote economic growth.

This chapter uses firm-level data for the years 2007 to 2013 to examine the

micro dynamics of entry, exit and aggregate productivity growth in the Vietnamese manufacturing sector. It contributes to the literature by adding to empirical knowledge, which is also expected to provide meaningful guidance for the Vietnamese policy makers.

The rest of the chapter is structured as follows. The chapter starts with a review of the literature on the impact of the selection processes in Section 5.2. Section 5.3 describes the methodology used to examine the competitive selection processes. Section 5.4 explains the firm entry and exit results and the aggregate productivity growth. Finally, conclusions and their policy implications are presented in Section 5.5.

5.2 Literature review

Competitive markets promote inputs reallocation where resources are transferred from less efficient firms to more efficient ones. Competition encourages firms to develop new technologies and products, as a result, leading to productivity improvements. The turnover of firms joining and leaving the market is considered the competitive selection process. There are two main approaches among existing empirical studies. First, studies provide empirical evidence on the entry and exit. Second, studies measure the contributions of new entrants, exiting and surviving firms to aggregate productivity growth.

5.2.1 Firm entry and exit theoretical models

Entry and exit behaviour is one of the important decisions of a firm. There are several standard models on the process of selection (Schumpeter, 1942; Jovanovic, 1982; Hopenhayn, 1992; Ericson and Pakes,1998), suggesting that firms enter new markets if their entry is expected to contribute to expected cash flow in the future.

From a theoretical perspective of Schumpeter (1942), firm entry and exit is thought to be "creative destruction" which describes two dimensions in the development of economies. On the one hand, entrants with the creation of completely new markets or industries contribute to their industrial evolution (Roberts, 1995), thereby promoting economic growth (Asuyama, 2013). New entering firms together with their new competitors from incumbents stimulate innovation and positively influence employment. On the other hand, such innovation could push inefficient incumbents with high degree of monopoly gained from previous incentives out of the market. It implies that exit is related to breaking structures and other socio-economic

consequences (Fritch, 2007).

Based on the "creative destruction" concept of Schumpeter (1942), a wide range of theoretical studies about firm entry and exit processes are categorized as passive and active learning models, capital vintage models and product life cycle models.

Following the passive learning model, in the initial stage, firms settle down business at a constant level. They do not know exactly their future productivity. After operating and producing, they learn about their own profit distribution. A process of natural selection appears and firms make decisions on expanding or exiting their business activities (Jovanovic, 1982; Campbell, 2005).

In the active learning model, firms enter the market and conduct active investments as well as innovation to improve productivity. Their potential and real profits change over time in response to the effects of investment. If they have enough capacity to cope with competition pressure from both inside and outside the industry, they survive and grow bigger. Otherwise, the optimal option is to leave the market is the optimal option (Lee, 2003; Poschke, 2010).

Regarding capital vintage models, it is assumed that new technology is embodied in more recent vintage capital. New entrants play an important role in the application of new technologies. Unlike existing firms, new firms do not have to bear the cost of capital upgrades. Nevertheless, firms invest in R&D to enhance their products or create new products. If R& D processes are successful, they will join the market and replace out-of-date and low-tech products (Audretsch, 2000; Haidar, 2012).

In terms of life cycle models, the firm's entry and exit process depends on the industry maturity level. The rates of entry and exit are high in industries that are in the early stage of innovation. Vernon (1966) established the product life cycle, a theory that every product has its own lifespan and goes through various stages from introduction to decline. In the product life cycle theory, Vernon established four distinct categories that all products go through. Some products linger in one stage longer than others, but they all eventually progress through the cycle from start to finish.

A wide range of new product designs from new entrants could attract consumers at that time (Roberts, 2000). However, after a period of time, firms have to stop competing in terms of product design and start competing on price and cost. Due to this, new entering firms may suffer from competition pressure from incumbents who

have the advantage of economies of scale. Consequently, the number of firms declines dramatically.

5.2.2 Determinants of firm entry and exit

Theoretical and empirical arguments, which have been established from the neoclassical model, suggest that 'basic' determinants of entry and exit can be classified into three categories. These are firm-specific, industry-specific and country-specific.

Firm-specific determinants

There is a relationship between firm entry and size. It is more likely that entrants have smaller size than the average firm size in the industry because of their unpredictable opportunities of success based on a number of comparisons between European countries and the US (Bartelsman, 2003; Cave, 2005). However, after entry, if results seem promising, small firms scale up. A link between firm exit and size was also found in the study of 39 manufacturing industries in Sweden from 1995-2000, with firms leaving the market having a smaller size than the average size of the industry (Hause, 2007). However, small-sized firms might leave the market before achieving their efficient scale of production, reflecting the intensity of the market selection process.

Firm age is also related to the exiting status of firms, especially for small- sized firms in 5-digit manufacturing industries in Portugal from 1982-1986 (Mata, 1991; Vahter, 1994). Young firms are likely to withdraw from the market because of the small amount of their own funds. As they are unable to compete in the first years of operation, they make losses and subsequently their capital is reduced. Then, based on the data of 79 3-digit manufacturing industries in United Kingdom from 1990 to 2000, insufficient funds do not allow the firms to pursue its activity and then they go bankrupt (Topi, 1999; Geroski, 2005). Similarly, due to the shortage of capital, the newly established firms could not access external funding and are not able to expand their operations. Thus, the available funds and the financial structure of firms is one of the determinants of exiting decision.

The model of Melitz (2003) analyzes productivity effects of firms' dynamics according to international trade. Being exposed to trade will let firms with higher productivity enter export markets and phase out the least productive firms. The basic assumption is that export activities require significant entry costs.

Industry-specific determinants

One important factor affecting entry and exit decisions of the firms is the characteristics of the industry and inter-industry differences. Lower rates of entry and exit appear in industries that require a high amount of sunk capital costs (Baldwin, 2006; Geroski, 2005). Firms operating in industries experiencing economies of scale and natural resources with high sunk cost requirements are least likely to enter and leave, whereas firms operating in labour intensive industries will suffer from a high rate of entry and exit. In addition, firms operating in creative and R&D based industries face high exit rates due to fierce competition.

Country-specific determinants

Besides firm and industry characteristics, firm entry and exit has been influenced by country level characteristics. The political, legal and economic status of each nation might affect the firms' inputs and outputs (Srinivasan, 2001). In addition, the political and economic stability also contributes greatly to the market development of enterprises. Thus, firms also decide to enter in the case of favourable conditions, otherwise they leave the market.

A series of empirical research examines the firm dynamics of manufacturing industries in developed countries such as the U.S. (Ecsnt, 2005; Audretsch, 2009; Dunne, 2010), Canada (Baldwin and Gorecki, 2007), Britain (Geroski, 2011), Germany (Schwalbach, 2011) and Portugal (Mata, 2013). The significant differences in rates of entry and exit between sectors are found and tend to correlate across sectors. Furthermore, entrants and exits account for a small share of the market and entrants are less likely to succeed. The entry and exit flows have a positive correlation and are described as a "revolving door at the bottom of the industry scale distribution" (Caves, 2008). The common finding of those firm-level studies is that low productivity firms have a higher likelihood of exit. Generally, there are two main reasons for firms to leave the market. The first reason is the change in ownership. A number of SOEs struggled in these harsh conditions and low-efficiency activities. They were soon liquidated and their shares sold to the private sector. Second, the owners may decide to close down an inefficient enterprise.

All of these studies are conducted in advanced economies with the assumption of the developed market conditions. However, this assumption is inappropriate for

transitional economies where markets and economic institutions are still forming. A firm's productivity level is an important determinant on decisions related to maintaining production, changing industry or leaving production. In a labour-abundant developing country, the Vietnamese firms operating in labour-intensive sectors are likely to have a smaller probability of exit.

5.2.3 Entry and exit and aggregate productivity growth

The decomposition of productivity growth comes through three sources. The first source refers to the productivity growth of incumbent firms with internal industry factors, called the "within effect". The second source is the resource reallocation from less insufficient to sufficient firms, called the "between effect". The last one is the productivity changes from the entry and exit processes, known as the "net entry" effect.

The effect of firm entry and exit on aggregate productivity growth is mixed. The experimental decomposition studies of aggregate productivity growth do conclude on the direct effect of entry. The direct contribution of entrants is argued to be relatively small (Baily et al.,1992; Griliches and Regev, 1995). A cross-country study by the OECD (2001) also suggests that whenever the net entry contribution is positive, exiting explains most of this impact. Firm entry requires the least productive firms to exit, creating market share reallocation among firms for the more productive firms (Yang, 2010).

In contrast, there are some studies suggesting that entering firms significantly contribute to industry productivity growth. The contribution rate accounts for up to 15–25 percent of the growth in productivity (Disney et al., 2003; Baldwin and Gu, 2006; Cantner and Krüger, 2008). An explanation for this contrasting evidence is the time horizon chosen for the productivity decomposition. If new firms experience a significant process of learning after entry, the direct entry effect will be higher (Foster et al., 2001; Cantner and Krüger, 2008).

In summary, there are some interesting patterns in the effects of firm entry and exit on aggregate productivity growth. The direct and indirect effects of new entrants are expected to influence aggregate productivity growth. However, the expected sign of the direct effect of entry is unclear. Evidence indicates a clear positive effect of entry and generally a positive correlation between entry and incumbents' productivity growth. Therefore, the indirect effects of new firms are expected to be greater than the

direct effects. In any case, the need for further research in a transitional economy is clear. In transitional and fast growing economies, entry and with-in firm effects become important. The process of structural change may emerge in the long run in these economies when new firms grow larger.

Table 5.1: Summary of decomposition of aggregated production growth

Authors	Country	Period	Within	Between	Cross	Entry	Exit
Baily et al. (1992)	U.S	1982-87	68.5 %	23.5 %		8%	
Foster et al (2001)	Latvia	1990-2005	68%	- 4.86 %	30.8%	15%	-1%
OECD (2002)	OECD	1980s-1990	85%	10%		2%	
Disney et al. (2003)	UK	1982-87	- 41%	-3%	- 51%	-0.12	
Biesebroeck (2005)	Colombia	1981 - 1991	33%		12%	21%	-29%
Fukao and Kim (2006)	Japan	1990-2003	-49%	-3%	-31%	-53%	-0.29 %
Haltiwanger (2007)	US	1995-2002	43.2 %	12.6 %	35.5 %	8.7 %	43.2%
Kong (2008)	Indonesia	1995-2003	66.4%	4.3%	-8.8%	37.9%	4.29%
Melitz and Polanec (2009)	Slovenia	1996-2001	10%-33%		18% to 12%	12%	-8%
Carreira and Texeira (2009)	Portugal	1996-2000	89-67 %	4 to 7 %	3-4.7 %	-1.1 to -1.8 %	6 to 30 %
Brown and Earle (2010)	Ukraine	1990-2005	-4%	13%	-27 %	80%	3%

***Source**: Compiled from various studies*

This study differs from the studies mentioned above in the following ways. First, data spanning from the year 2007 allows an investigation of the potential impact of the WTO accession on the competitive selection process of the Vietnamese manufacturing firms. Second, the study emphasizes the contribution of productivity improvement of firms on aggregate productivity growth.

5.3 Methodology and data

5.3.1 Objectives and hypotheses

This chapter aims to examine the competitive selection process by estimating the micro-dynamic effects of firms staying, entering and exiting on aggregate productivity growth using firm level data in Vietnamese manufacturing. There are three main objectives as follows:

(i) To analyze the patterns of firm entry and exit.

(ii) To analyze the processes by which firms decide to enter and exit

(iii) To estimate the effect of firm entry and exit on aggregate productivity growth.

These objectives are formulated into the following hypotheses:

H5.1: Exiting firms have lower TFP levels than incumbents.

H5.2: Entry firms have lower TFP levels than incumbents.

H5.3: Entry firms are more productive than surviving firms.

H5.4: Firm productivity improvement is the main component of productivity growth.

5.3.2 Data

The data used in the econometric analysis is from the annual enterprise survey from 2007 to 2013 conducted by the GSO. The survey covers all SOEs, FIEs and private firms.

The definitions of surviving firms, entrants, and exiting firms are adopted from Dunne et al. (1988). Firms are classified as:

- an entrant if the firm appears in year t but not in year $(t - k)$
- an exiting firm if it appears in year $(t - k)$ but not in the year t
- an incumbent if it appears in both year $(t - k)$ and year t.

Entrants ratio is calculated by the number of new firms divided by the total number of firms. Exit rate is calculated by the number of firms leaving the market divided by the number of all firms.

5.3.3 Methodology

This section examines the correlation between firm productivity and the firm entry and exit. Instead of labour productivity, TFP is chosen as a measure of firm performance because of its comprehensive meaning. This issue is analyzed in two aspects: whether less productive firms leave the market or not and how firm entry and exit influence aggregate TFP growth.

5.3.3.1 The effects of entry and exit, and productivity differentials

An analysis with cohorts is employed to address this issue. Cohort analysis is based on the idea of following a group of individual firms over different points in time, hence dynamically tracking their behaviour. In this section, the study employs the

approach in Aw et al. (2001), focusing on the behaviour of both entry cohorts and exit cohorts.

5.3.3.2 Entry, exit and aggregate productivity growth decomposition

The aggregate productivity growth is decomposed from year $t-k$ to year t (Baily et al., 1992).

$$\Delta A_t = \sum_{i \in S} \theta_{i,t-\mathrm{k}} \Delta A_{i,t} + \sum_{i \in S} \Delta\theta_{i,t} \Delta A_{i,t} + \sum_{i \in N} \theta_{i,t} A_{i,t} - \sum_{i \in X} \theta_{i,t-\mathrm{k}} (A_{i,t-1}) \quad (5.1)$$

where ΔA_t denotes aggregate productivity change between year $t-k$ and year t .

$\theta_{i,\mathrm{t}}$ is the share of firm i

$S, N \; and \; X$ are sets of surviving, entering and exiting firms during from $t-k$ to t.

This decomposition has four terms that show the contribution of various components to aggregate productivity change.

The first group of terms denotes the contribution of surviving firms, called the within –firm effect. It examines the contribution on aggregate productivity growth coming from improvements in each surviving firm separately when holding output share constant. The second group of terms denotes the between- firm effect, reflecting the contribution from the changes in the output shares when holding productivity measure constant. The last two groups are entry effect and exit effect, respectively. Net entry indicates the contribution of entering firms displacing exiting firms. The net entry effect is likely resulting from a considerable number of new entrants.

5.4 Empirical results

5.4.1 The pattern of entry and exit

Table 5.2 presents the entry and exit patterns of the Vietnamese manufacturing firms from 2007 to 2013.

Table 5.2: Entry and exit patterns of the manufacturing firms 2007–2013 (firm count)

	Total	Entrants	Incumbents	Exiting firms	Entrants Ratio	Exiting Ratio
2007	12,135		12,135			

2008	13,797	3,725	10,072	2,063	0.27	0.17
2009	14,007	5,463	8,544	2,621	0.39	0.19
2010	16,944	5,930	11,014	4,202	0.35	0.30
2011	18,000	5,760	12,240	2,711	0.32	0.27
2012	19,136	7,654	11,482	2,700	0.40	0.22
2013	21,980	7,913	14,067	5,358	0.36	0.28

***Source**: Authors' calculation from VES.*

There is a dramatic increase in the number of firms between 2007 and 2013. This increase may reflect the economic boom in Vietnam after joining the WTO. Within one year from 2006–2007, Vietnam has revised over 60 legal documents together with hundreds of decrees and circulars to implement WTO commitments. A series of business barriers have been removed. The WTO has put pressure on Vietnam to gradually shift from a state administrative intervention method to a state management regime with respect for business freedom, according to market laws. As a result, 2007 was the opening year for a new boom of Vietnam firms.

However, the rates of exiting firms are quite high, varying from 0.17 to 0.30. Despite this, the entry rate outweighs the exit rate, leading to the overall increase in the number of firms from 2007 to 2013. The entry rate has generally increased over the years and peaked in 2013, whereas the exit rate was more variable, bottoming in 2012 and then rebounding to twice that level in 2013.

A high correlation between entry and exit rates has been found in developing economies. However, the rates of exiting firms are smaller than those of entering firms. It is in line with the expansion of the Vietnamese manufacturing sector, experiencing the context of accelerated paces of both entry and exit corresponding to the positive effects of extensive trade openness since WTO accession.

5.4.2 Firm entry and exit and productivity differentials

Table 5.3 presents changes of the firms' behaviour in both the entry cohort and exit cohort. It shows calculated survival rates for firms entering the market. There are two types of survival rates presented. The conditional survival rate is calculated by the number of survivors divided by total number of firms in the previous year. The unconditional survival rate is calculated by the number of surviving firms over the total number of firms in the original entry year.

The results in Table 5.3 indicate that the conditional survival rate ranges from 75.6 percent to 90.5 percent. It implies that approximately 10 to 25 percent of firms in each cohort withdraw from the market after one year of entry. In addition, over one-

third of the firms exit from the market three years after entry and nearly a half of firms exit within six years. It is consistent with the research of Yang dealing with Chinese data and those of other countries such as Japan (Kiyota, 2005).

Table 5.3: Entry and exit patterns of the manufacturing firms 2007–2013 by entry cohort (firm count)

Year	2007	2008	2009	2010	2011	2012	2013
Conditional survival rate (previous year =100)							
2007	100						
2008	83.6	100					
2009	89.0	81.1	100				
2010	89.4	85.0	80.7	100			
2011	90.5	88.6	84.6	83.5	100		
2012	89.9	88.7	85.2	87.0	75.6	100	
2013	90.1	87.4	85.6	84.6	84.0	77.1	100
Unconditional survival rate (entry year =100)							
2007	100						
2008	83.6	100					
2009	75.1	81.1	100				
2010	68.0	69.6	80.7	100			
2011	62.1	61.4	69.0	82.4	100		
2012	56.4	56.0	59.4	72.4	75.6	100	
2013	51.3	49.3	51.4	61.9	64.1	77.1	100

Source: *Author's calculation based on VES.*

Firm size measured by the mean number of employees per firm together with mean real value added and TFP from 2007 to 2013 are presented in Table 5.4. It also shows the un-weighted mean of firms' TFPs across industries.

Table 5.4: Firm size and productivity, by year

Year	Mean		
	Employment size	Value added	TFP
	Number of workers	Million VND	
2007	222	10,210	1.00
2008	235	10,430	1.03
2009	239	10,622	1.12
2010	245	10,748	1.21
2011	257	10,885	1.27
2012	269	11,678	1.29
2013	296	12,121	1.31
Year	Growth rate (%)		
	Employment size	Value added	TFP
2007-08	4.72	17.16	10.03
2008-09	2.71	17.24	15.23
2009-10	4.13	20.85	16.51
2010-11	3.39	22.11	16.96
2011-12	3.45	24.28	17.03
2012-13	3.62	24.97	18.65

Source*: Authors' calculation, based on the Annual Survey on Enterprises by the GSO.*

It is noteworthy that the average employment size has experienced substantial

increase since 2007 due to more competition from trade opening and domestic market. The small firms are forced to exit the market because of the pressure from foreign-owned firms. Furthermore, competition pressures created by appropriate reforms in line with WTO accession push manufacturing firms to utilize their available resources more efficiently. The growth rates of employment size and TFP exhibit a positive trend during the first seven years of joining the WTO. It is again observed that while the world economy suffers from the global financial crisis, TFP of the Vietnamese manufacturing firms is less influenced and grows strongly.

Table 5.5: Employment size and TFP of manufacturing firms by survival status

Year	All firms	Employment size			All firms	TFP		
		Entrants	Incumbents	Exiters		Entrants	Incumbents	Exiters
2007	224		224	227	1.40		1.40	1.44
2008	217	206	233	82	1.43	1.37	1.46	1.24
2009	222	109	272	78	1.55	1.39	1.59	1.33
2010	227	95	274	134	1.53	1.43	1.69	1.32
2011	216	89	261	70	1.65	1.65	1.77	1.55
2012	201	103	260	115	1.62	1.82	1.85	1.59
2013	209	93	256	62	1.77	1.94	2.11	1.70

***Source**: Authors' calculation, based on the Annual Survey on Enterprises by the GSO.*

Table 5.5 illustrates the unweighted mean of employment size and the mean TFP across firms in terms of survival status. It is clear that the average employment size of entering and exiting firms is smaller than that of continuing firms. This result implies that larger firms are more likely to survive. It can be explained by the fact that those incumbents exploit Vietnam's comparative advantage in labour resources. The employment expansion of existing firms is associated with increases in their skill labour force (Kambhampati, 2003). Larger firms tend to be more efficient than smaller firms because of their ability to exploit economies of scale or operate at lower points of their cost function. They have much better access to capital and technology (Battese, 2005).

In addition, in terms of TFP, the survivors are the most productive and the exiting firms are the least productive (except year 2007). Under the period of trade openness, some less productive firms leave the market and the incumbent firms operate more productively. It is consistent with the study of Aw et al. (2001) for Taiwanese manufacturing industries and Yang (2006) for Chinese manufacturing industries. The average TFP of the incumbents goes up from 2007 to 2013, indicating the cutoff productivity level increased after trade liberalization. TFP level is also the predictor for exiting status. On average, firms leaving the market are more than 20 percent less

productive than surviving firms. This result is consistent with the prediction by models of firm heterogeneity that market selection processes remove low-productivity firms from the market. In addition, the TFP difference between surviving firms and exiting firms has been widening through the years, implying that leaving the market is not random but originates from persistent declines in productivity. It suggests that the cutoff productivity level increased after trade liberalization.

Also from Table 5.5, it can be seen the productivity gap between entrants and existing firms is likely to be narrowed. The potential entrants take advantage of externalities from technology innovation improving their productivity (Grossman and Helpman, 1995).

Table 5.6 shows SOEs exits are lower than others. As discussed, SOEs are the key elements of the Vietnamese economy. Thus, the performance of SOEs is expected to be markedly different from FIEs and private firms. In 2007, the State Council Investment Corporation (SCIC) was established to be responsible for managing the state assets held by newly equitized firms. As a result, a number of SOEs have been equitized and transformed into joint-stock companies to achieve better performance.

Table 5.6: The Number of exits

	Total Number of Exits	Share of Exits (%)			
		Small Firms	SOEs	PRIV	FDI
2007					
2008	2063	100.0	2.2	68.5	29.3
2009	2621	100.0	6.7	72.6	20.7
2010	4202	99.5	11.8	81.4	6.8
2011	2711	100.0	5.3	78.7	16.0
2012	2700	99.1	9.3	70.6	20.1
2013	5358	98.2	9.0	81.3	10.7

***Source**: Author's calculation based on the VES.*

After Vietnam's accession to the WTO, private firms are significantly more likely to leave the market without any shielding from fierce competition, when compared to SOEs. There are several reasons for such difficult circumstances. First, private firms do not have any incentives to help them avoid withdrawal when competitive pressures increase. Second, most private firms currently do not have the scale or access to capital necessary to compete (Malesky and Taussig, 2009). Even in 2010, after the dramatic growth of the private sector, approximately 30 percent of bank credit from the Vietnamese state-owned banking sector is for private firms (Nguyen, 2015). Third, using land use rights certificates as collateral, the processing time of

private firms are five times greater than SOEs. Despite the elimination of entry and exit barriers, the private sector has been disadvantaged in terms of access to important resources as well as discrimination in the administrative system (Thanh, 2010).

Table 5.7: TFP of manufacturing firms, by entry-year cohort

Year	All firms	Before 2008	2008	2009	2010	2011	2012	2013
2007	1.40	1.40						
2008	1.43	1.46	1.43					
2009	1.55	1.52	1.65	1.33				
2010	1.53	1.61	1.80	1.63	1.32			
2011	1.65	1.70	1.86	1.74	1.73	1.39		
2012	1.62	1.84	1.99	1.84	1.83	1.72	1.31	
2013	1.77	1.89	2.02	1.94	1.95	1.75	1.79	1.35

***Source**: Author' s calculation based on the VES.*

The unweighted means of TFP by entry cohort are presented in Table 5.7. As confirmed above, survivors are generally more productive than new entrants. The table indicates that the longer time the firm stays in the market, the higher its productivity will be. For almost all entry cohorts, TFP increases gradually over time.

It should be noted that each entry cohort shows very rapid improvement in productivity following entry, and catches up with surviving firms after several years. Thus, the results are supportive of the presence of rapid learning by survivors, especially during the first years after entry. The results indicate that productivity growth is one of the key determinants for firm survival in in manufacturing in Vietnam.

5.4.3 Turnover effects and aggregate productivity growth

As discussed in the methods of productivity decomposition section 5.3 above, the decomposition in the manufacturing sector in Vietnam is now examined.

Table 5.8: Decomposition of the annual TFP growth in the manufacturing sector

Period	TFP growth total	Within effect	Between effect	Net-entry effect	Entry effect	Exit effect
2007-08	0.157	0.186	-0.152	0.123	0.265	0.142
2008-09	0.165	0.274	-0.256	0.147	0.312	0.165
2009-10	0.192	0.301	-0.145	0.036	0.292	0.256
2010-11	0.201	0.265	-0.092	0.028	0.263	0.235
2011-12	0.231	0.373	-0.165	0.023	0.575	0.552
2012-13	0.273	0.324	-0.196	0.145	0.329	0.184
Average	0.203	0.287	-0.167	0.083	0.188	0.105

***Source:** Author' s calculation based on the VES.*

Table 5.8 presents the decomposition results for the Vietnamese manufacturing firms for the period of 2007–2008 to 2012–2013. Generally, aggregate productivity

growth of total manufacturing sector increases for the whole period. The growth rate reached 27 percent in 2013. The dominant source of aggregate productivity growth is the within-firm effect rather than net-entry effects and between-effect. The existing firms have become more productive through better utilization of factor inputs according to the underlying comparative advantage in terms of using more labour which is an abundant factor in Vietnam. It is consistent with the study of Chang et al. (2010) for Taiwan.

It is worth noting that the contribution of resource reallocation (between-effect) is negative. However, the contribution of the firms' productivity improvement (within-firm) is positive and larger. Thus, the contributions of survivals are positive to productivity growth over the survey period.

These results indicate that new entrant firms displacing exiting firms are more productive. The entering firms have higher productivity than the exiting firms, thus the differences are big enough to have a positive contribution to aggregate productivity growth. The growing number of new firms created due to the relaxation of the trade regime is likely to increase the productivity growth in Vietnam. This is similar to the finding of Yang (2016) in China for the period 2000–2010. In 2007–2013, TFP growth rate is 20.3 percent with the contribution of 28.7 percent from productivity improvement of surviving firms, 8.3 percent from the net-entry effect and 16.7 percent from the between- effect.

In summary, this finding may suggest a more important role of encouraging new entrants into the market. The Vietnamese manufacturing firms seem to exploit the production capacity of the existing capital stock combined with greater use of labour to increase productivity.

5.5 Conclusion

This chapter examines the impact of firm entry and exit on aggregate productivity growth in Vietnamese manufacturing over the period 2007–2013 coinciding with intensive international economic integration.

Analyzing firm entry and exit by cohorts indicates existing firms have higher productivity than entering and exiting firms. Entrant firms achieve the largest productivity improvement after two years of operation. The productivity gap between

entering and surviving firms is gradually narrowing. Under trade liberalization, the comparative selection processes taking place in Vietnam force inefficient firms out of the market and the incumbent firms to expand to become more efficient.

The aggregate productivity growth is decomposed into the effects of individual firm growth, resource reallocation, and entry and exit. Aggregate productivity growth is driven by the substantial contributions of new entrant firms. Thus, new enterprises appear to be a driving force of manufacturing performance through competition. However, the survivors are still holding a vital stabilizing role in the economy. This trend is consistent with the theoretical prediction for a developing country in the period of trade opening.

The structure of the economy has shifted toward export-orientation, suggesting a strong response to changes in the trade policy regime. Given this background, the next chapter will carry out empirical investigation on the casual relationship between exports and productivity.

Chapter 6

Exporting and firm productivity

6.1 Introduction

Trade liberalization, along with increased export orientation, has greatly impacted on the global economy and economic performance of trading nations. Exports are expected to promote economic growth through reallocation of scarce resources toward industries that are more productive, experience economies of scale and have access to new technologies and knowledge.

The focus on this chapter will be on the association between exporting and productivity at the firm level. The direction of causality – productivity increases exports or exports enhance productivity – accounts for the majority of the recent trade-related literature. There are two competing theories that are usually tested to explain the superior performance of exporters: (i) self-selection (SS) and (ii) learning-by-exporting (LE).

The SS theory proposes that sunk entry costs consisting of transportation, seeking new markets and the modification of domestic goods are prerequisites to domestic firms entering into export markets. Thus, it is expected that more productive firms with sufficient funds are able to access the export markets. This proposition is also known as trade-induced within-firm productivity improvement (Lach and Tybout, 1998).

On the other hand, the LE hypothesis emphasizes reverse causality, in that productivity improvements of exporting firms stem from their foreign markets entrance. They obtain incentives from management and marketing experiences with export trading partners.

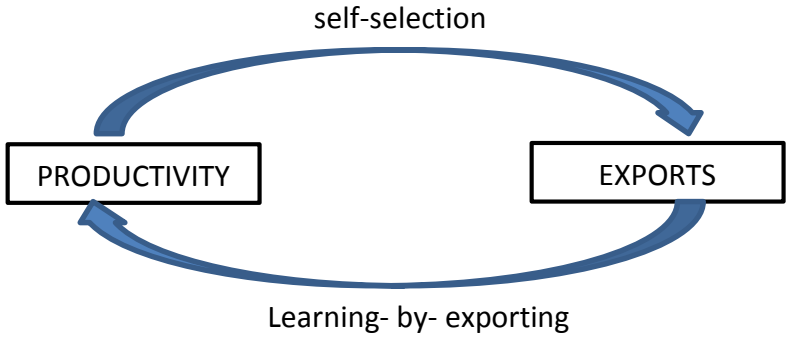

Figure 6.1: Direction of causation between productivity and exports

***Source**: Author constructed.*

Whilst the SS and LE theories clearly explain the superiority of exporters over non-exporters in terms of firm performance, the practical evidence is still mixed. Although few recent empirical studies address this concern, it is still crucial to observe the Vietnamese context for several reasons. First, the magnitudes of the exporting effect might provide further insights into the findings of the productivity analyses in Chapters 4 and 5. Second, the incidence of Vietnam exports possibly explains a slower rate of exports in comparison to other developing countries. As for the previous chapters, the period of analysis starts with joining the WTO, and this will allow analysis of exporters' survival in the post-WTO period.

This chapter investigates exporters and productivity by using a firm-level dataset covering the Vietnamese manufacturing sector during the period from 2007 to 2013. It examines differences between exporter and non-exporter and then tests the two hypotheses, SS using the probit model (to examine the effects of key factors on firm export participation) and LE using matching techniques. Testing these two hypotheses allows examination of the causality between TFP and export behaviour.

The rest of the chapter is organized as follows. Section 6.2 includes the literature review about the theoretical and empirical relationships between export and firm productivity. Section 6.3 explains data and methodology. Section 6.4 presents empirical results of this research. A summary and conclusions are discussed in Section 6.5.

6.2 Literature review

The relation between exports and productivity has been extensively studied by traditional trade theories ranging from the theoretical comparative advantage for inter-industry trade models (Ricardo and Hechsker-Ohlin, 1933) to the models of intra-industry trade (Helpman and Grossman, 1995). Theories including heterogeneous firms followed these traditional approaches. As mentioned in the introduction, whilst the correlation between exporting and higher firm productivity is observed, which accords with the SS and LE theories, the empirical evidence of these links is not so conclusive. In this section, theory and empirical results will be included for a clear overview of the determinants influencing the empirical evidence.

6.2.1 Self-selection (SS)

The SS hypothesis is grounded in heterogeneous trade theories, described as a basic platform for firms to decide entering exporting activities. When domestic markets are not large enough for firms to exploit, targeting a broader market is necessary. The SS mechanism takes place via a link from productivity to exporting.

The first study of Bernard and Jensen (1995) examines the fundamental reason of the correlation between export and productivity. However, the SS hypothesis explains only half of this correlation. They demonstrate that the entry sunk costs are not zero and are based on the firms' exporting experience and plants' characteristics, such as size and location. Taking a firm in a remote area as an example, it will have to pay additional shipping costs in comparison to a firm located near a trading centre.

$Y_{it} = 1$ indicates a firm exports if the condition that current and expected revenues are higher than its costs is satisfied,

$$Y_{it} = \begin{cases} 1 \; if \; \hat{R}_{it} > \; c_{it} + N(1 - Y_{it-1}) \\ 0 \qquad\qquad\qquad otherwise \end{cases} \tag{6.1}$$

where $\hat{R}_{it}$ is firm i's discounted exporting revenue at time *t*.

c_{it} is cost production of firm i today

N is the entry sunk cost that firm i has to pay.

A developing body of studies has demonstrated the microeconomic aspects of a firm's performance, to investigate its export activity as well as the causes and effects of the export activity. A common finding is that exporting firms are generally different from non-exporting firms in key aspects such as having more sophisticated technologies, larger size and higher wages offered (Lach and Tybout, 1997; Clerides et al., 1999; Bernard and Vahter, 2007).

Furthermore, on the emphasis of the role of industrial accumulation, it is suggested that the role of firm size, wages, productivity and industrial accumulation determines the possibilities that manufacturing firms in the UK will access exporting activities (Temouri, 2007). Selection effects of most productive firms entering the export markets might be a conscious process as firms improve their productivity in preparation for exporting (Kneller, 2007). Regarding the role of firm size, larger firms are more likely to export than smaller ones (Damijan, 2004). Firm size is considered an

important factor in influencing the firm managers' decisions on exports.

Additionally, the impact of foreign ownership and FDI on firms' probability of exporting is investigated in the empirical studies. Sinani (2010) proposes that firm's foreign ownership together with the membership of foreign networks may affect firms' exporting decisions in the case of Chilean manufacturing firms. Foreign firms rather than domestic ones are more likely to export in the UK (Girma, 2004). FIEs might be advantageous in handling costs and accessing updated technology because they already absorb knowledge as well as experience in overseas markets.

On the other hand, several empirical studies find no significant effect when testing the SS hypothesis (Aw et al., 2001; Castellani, 2003; Jensen, 2004). In the case of South Korea, Aw et al. (2002) argue that export market entry costs dropped significantly in the mid-1980s. It was due to the Korean Government urging exports by subsidizing firms. Thus, the export decision of Korean firms was based on their abilities to access financial resources and approach foreign customers, instead of improving their productivity.

In the case of Vietnam, it is revealed that exporting firms mainly operating in sectors with low-skilled labour and raw materials (Kokko, 2012) have higher labour productivity than non-exporters. The presence of foreign firms in Vietnam's manufacturing sector has a positive impact on the export decisions of domestic firms (Thang and Ngoc, 2004). Tran and Bui (2012) also find that process and product innovation are the main factors that determine the firms' exporting. Their results are consistent when controlling for other factors such as ownership of domestic firms and geographical proximity to foreign firms.

In summary, firm productivity with a positive effect on firm export behaviour through the SS hypothesis has been found in various empirical studies. However, there are few studies on this subject in an economy transitioning from a centrally-planned economy to a market-oriented economy. Thus, the study utilizing Vietnamese manufacturing firm-level data examines the impact of firm productivity on exports.

Although SS seems to be an explanation of exporters being more productive and their performance being better than non-exporters, it is not necessarily the only explanation. As theory suggests, firms with better performance might enter exporting activities, taking incentives from international partners and therefore improving their

firms' productivity (Vahter, 2012). This impact is LE, which will now be explained.

6.2.2 Learning-by-exporting

Experience and knowledge gained from participating in export markets from competitors and buyers will help firms grow faster than others only operating in domestic markets (Bernard and Jensen, 1999; Bernard and Wagner, 2007; Afonso et al., 2012). The effect of learning from exports comes from two-dimensional knowledge diffusion: vertically as the competition of firms and horizontally as the comparison of customers.

Wagner (2012) suggests that competition (vertically) comes directly from competitors penetrating the international market. Thereby being exposed to more intense competition, exporters must innovate constantly to survive in an international competitive environment. Exporters must therefore apply the most modern technologies. When firms conduct continuous innovation, it leads to technological advancement and ultimately to increases in productivity (Anderson, 2009).

Together with horizontal competition, foreign customers might push exporting firms to improve the technological process by providing product designs, technical specifications and technical support. Knowledge accumulated in the export activities is primarily the result of these learning activities. Learning through exports relates to the benefits that exporters derive from the knowledge of buyers. The buyers' stringent technical standards help exporting firms to become more aware of new technology and methods transforming inputs into outputs. Therefore, the products fit the demand of consumers (Bernard and Jensen, 1999; Bernard and Wagner, 2007; Haidar, 2012). The study of Mertin and Yang (2009) reaffirms the above point of view by showing that exports can increase firm productivity due to economies of scale. Enhancing exports allows firms to scale up, reduce costs and as consequence, productivity will be improved.

To sum up, international consumers and competitors will transfer knowledge and technology to domestic firms participating in exports, marking the transfer of traditional technology to modern technology (Rodrik, 1992; Grossman and Helpman, 1995; Clerides et al., 1999)

Following empirical studies, significant evidence of positive effects of exports can be observed in developing countries. In such countries, the diffusion of knowledge

is even more beneficial because of spillover effects of exporters' behaviour to surrounding firms. In particular, importers in developed countries require a certain level of standard from exporters in developing countries. These importers will provide technology to exporters due to the fact that production techniques in developing countries do not meet export market quality standards (Aw et al., 2001; Lopez, 2005; Love, 2013). Models developed by Pack and Saggi (2001) emphasize the importance of buyers' motivation to provide technology to sellers. Importers in developed countries are ready to transfer knowledge to exporters in developing countries.

The literature review indicates the range and complexity of empirical studies testing the causality between exports and productivity in different contexts. Bernard and Jensen (1997, 1999, and 2003) conducted pioneering empirical research to test SS and LE hypotheses. Using a set of business data in the US and various research methods, they found the relationship between exports and productivity. The research results support SS in that firms are more productive before entering the export market, but it does not support the LE mechanism. After Bernard and Jensen's, other empirical studies include other countries such as Mexico, Columbia and Morocco (Clerides et al., 1998), Canada (Baldwin and Gu, 2003), and Germany (Bernard and Vahter, 1997, 2001). These studies confirm that firms participating in export markets are more productive than firms which do not participate in exports. They found no evidence of learning through exports.

However, some other researchers found evidence of LE mechanisms in developed countries like Britain (Crespi et al., 2008), America (Girma et al., 2004), France (Bellone et al., 2008), Italy (Castellani, 2007), and Argentina (Albornoz et al., 2007). Empirical studies in developing countries have found evidence of LE with research in Indonesia (Blalock and Gerler, 2004), Africa (Van Biesebroeck et al., 2005), Columbia (Fernandes, 2005), Egypt (Kazem et al., 2006), and China (Kraay, 1999, Park et al., 2010).

Additionally, there are other empirical studies that find both SS and LE mechanisms in Chile (Alvarez and Lopez, 2005), Japan (Kimura and Kiyota, 2006), Korea (Greenaway and Yu, 2004), and Ethiopia (Bigsten and Farina, 2009). However, there are also some studies that found no evidence of both mechanisms in Switzerland (Greenaway et al., 2005), and India (Sharma and Mishra, 2015).

Thus, the results of empirical studies are mixed and mostly find the SS mechanism rather than LE mechanism.

Table 6.1: Exports and productivity of firms in different countries

Authors	Country	Methodology	SS	LE
Aw and Hwang (1995)	Taiwan	Translog production function	Yes	No
Clerides et al. (1998)	Colombia, Mexico, Morocco	Translog production function	Yes	Morrocco: Yes Columbia & Mexico: No
Bernard and Jensen (1999)	USA	Linear probability with fixed effect	Yes	No
Kraay (1999)	China	Dynamic panel	Yes	No
Castellani (2002)	Italy	Cross-section	Yes	Yes
Delgado et al. (2002)	Spain	Panel data, matching	Yes	No
Bernard and Vahter (2002)	Germany	Panel data, matching	Yes	Yes
Greenaway (2002)	UK	Panel data, matching	Yes	No
Alvarez (2002)	Chile	Cross-section	Yes	Yes
Yu (2004)	UK	DID	Yes	No, firms exiting because of market share lost
Blalock ang Gertler (2004)	Indonesia	Translog production function	Yes	Yes
Fernandez et al. (2005)	Colombia	DID	not examined	Yes for young firms and industries targeted to high income countries
Alborno et al. (2007)	Argentina	Panel data, GMM	Yes	No, higher productivity for exporting to more developed countries
Kazem (2007)	Egypt	Panel data, matching	Yes	Yes if exporting to more developed countries
Garcia (2012)	Spain	Translog production function	Yes	Yes, technological capacity affects to knowledge diffusion
Boermans et al. (2013)	Ghana and Nigeria	Cost function	Yes	Yes, improvement in labour recruitment
Vu (2012)	Vietnam	Fixed effect	Yes	No

Source: *Author's summary from previous studies*

There are two explanations for this tendency. Firstly, the LE mechanism appears only when firms have the capacity to absorb knowledge generated by export activities. The second reason relies on the individual characteristics of the importing/ destination country.

For the first reason, according to the theory of LE mechanism, the knowledge that firms absorb through trading activities with foreign partners, will be used by these firms in the production process (Salomon and Shaver, 2005). Firms will apply new knowledge to improve and upgrade their current production processes or may decide to fully utilize the new production process. It will increase firm productivity as the result of export-based

learning.

However, researchers argue that not all exporters are capable in acquiring knowledge and learning from foreign partners, due to differences between firms in terms of technology capability (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993). According to Cohen and Levinthal (1990), absorption capacity influences the development of technological capacity. With this argument, the spread of knowledge due to export activity depends on the firms' ability to identify the value of knowledge from outside. Firms with better absorption capacity will be better able to learn from foreign partners and absorb the knowledge via the production process (Garcia et al., 2012).

Investment in R&D helps businesses improve their ability to synchronize, combine and apply current knowledge and new knowledge. This also means that when faced with new knowledge about technology from the external environment, firms that invest in R&D activities are better able to realize the usefulness of this knowledge and incorporate it into production activities (Garcia et al., 2012). To test this hypothesis, García et al. (2012) conducted empirical research focusing on how technology capacity of firms affects the relationship between exports and firm productivity.

The result of the study finds that exports have positive effects on firm productivity, confirming the evidence of the LE mechanism. The study is consistent with the studies of Aw et al. (2008) and Castellani (2007). In addition, the results also indicate that not all businesses receive the same benefits from export activities. Firms with higher levels of R&D investment than the industry average have higher productivity than others with R&D investment levels below than the industry average. The research of Salomon and Jin (2010) also points out that investment in R&D not only improves the ability of exporters to apply foreign knowledge into innovation activities but also helps firms improve productivity by learning through exports.

Other studies highlight the role of knowledge absorption in LE mechanisms including Argentina (Albornoz et al., 2007). The empirical evidence is consistent with the argument on the importance of the absorption capacity of firms (Cohen and Levinthal, 1990). Although firms can benefit from access to knowledge from partners, firms need to have the knowledge base to recognize the value of outside knowledge and fit it into production processes.

The second explanation is that the destination of exports also affects export firm productivity. Specifically, exporters to more developed countries are more productive (LE evidence found) than exporters to less developed countries (LE evidence not found). The reason is that customers in more developed countries expect higher quality of products so they will motivate exporters to improve production. On the other hand, developed countries have higher levels of production technology that will help technology transfer to exporting countries. This argument is supported by empirical studies such as Damijan et al. (2004). De Loecker (2004) tests whether the LE hypothesis depends on the place of export. Research results show that exporters to more developed countries will achieve higher productivity (Mengistae and Pattillo, 2004; Graner and Isaksson, 2007; Eaton et al., 2008; Boermans, 2010).

For Vietnam, there are also studies on the relationship between exports and productivity. Nguyen et al (2012) examines the causal relationship between exports and productivity by using SME survey data from 2005 to 2009 and using various methods such as Fixed Effect model and IV model. The research results show that there is evidence of the SS mechanism, in that more productive enterprises will participate in export activities. The study does not find any evidence of SS involving export activities.

In summary, the literature suggests that the evidence of the causality between productivity and exporting is mixed. There is empirical support for the self-selection (SS) theory for developed countries, but not really for developing countries. The empirical evidence for the learning-by-exporting (LE) theory is also mixed, with some support for developed countries, but more support for developing countries.

The evidence presented here indicates that being exposed to more developed destinations can be advantageous to Vietnam's exporters but it is not clear how this may happen. Following on from this literature review, the research in the next section examines the causality between exporting and firm productivity using Vietnam's manufacturing firm data.

6.3 Methodology and data

6.3.1 Objectives and hypotheses

Vietnam is a transitional economy, pursuing export-led growth strategies and experiencing a fast track of trade liberalization. The objective of this research is to examine the causal relationship between exporting and productivity of the Vietnamese

manufacturing firms.

The specific questions this chapter aims to address are as follow:

Does firm productivity in the Vietnamese manufacturing sector increase exports?

Do exporting activities enhance firm productivity in the Vietnamese manufacturing sector?

Based on these research questions, the following hypotheses are determined:

H6.1. Exporting manufacturing firms are more productive than non-exporting ones.

H6.2. More productive manufacturing firms are more likely to enter into export markets.

H6.3. Vietnamese manufacturing firms increase their productivity by learning-by- exporting.

6.3.2 Data

The empirical analysis of firm performance is based on the GSO enterprise dataset, which is available from 2007 to 2013. These data cover registered firms including data on firm revenues, total firm employment, fixed assets, investment, exporting activities and establishment year. Data used in this study are for 21,980 firms in all manufacturing sectors, for the years 2007 to 2013. Variables are deflated at constant 2000 prices, where appropriate.

Table 6.2 provides descriptive statistics about export patterns of manufacturing firms. Around 55 percent of the total number of firms exports. The proportion of firms changing their export status from non-exporting to exporting (entrants) is on average 4.7 percent and from exporting to non-exporting (quitters) is 4.3 percent.

Table 6.2: Export patterns of manufacturing firms

Year	Number of firms	Exporters (%)	Entrants (%)	Quitters (%)
2007	12,135	56.3	4.6	4.1
2008	13,797	53.8	4.2	4.4
2009	14,007	52.3	4.5	5.2
2010	16,944	52.8	5.6	4.7
2011	18,000	52.3	4.5	4.4
2012	19,136	53.2	4.4	3.7
2013	21,980	56.3	5.1	3.5

***Source**: Author's calculation from VES*

Table 6.3 shows descriptive statistics for selected variables for exporters and non-exporters. TFP calculated in Chapter 4 is used here. The average TFP of exporters is higher than that of non-exporters. The size of exporters and average wage are also larger than for non-exporters. Non-exporting firms tend to have more capital and to be younger than exporting firms. Whilst the variation of TFP is similar for both types of firms, exporters have more variation in the other variables, particularly for wages, than non-exporters.

Table 6.3: Descriptive statistics for exporters and non-exporters

Variable	Descriptions	Observation	Mean	Std. Dev.
Exporters				
lnTFP	The log of Total Factor productivity	38,654	1.72	0.79
lnWage	The log of average wage per employee	38,654	2.65	0.72
lnsize	The log of firm size	38,654	4.89	1.72
lnKL	The log of capital intensive	38,654	4.49	1.48
lnAge	The log of firm age	38,654	2.86	1.30
Non-Exporters				
lnTFP	The log of Total Factor productivity	31,628	1.21	0.78
lnWage	The log of average wage per employee	31,628	2.03	0.57
lnsize	The log of firm size	31,628	3.89	1.45
lnKL	The log of capital intensive	31,628	4.66	1.24
lnAge	The log of firm age	31,628	1.86	1.10

***Source**: Author's calculation from VES*

The next section describes the methodology used to test for causal effects between exporting and firm productivity.

6.3.3 Methodology

6.3.3.1 Export premium

The differences between exporting and non-exporting firms can be analyzed in terms of the export premium (Bernard and Jensen, 1999). The simple export premium is the percentage difference between export status in the mean level of firm characteristics: revenue, TFP, employment, wage, capital intensiveness and age. Each characteristic is regressed on the export status of firms:

$$lnZ_{it}^{*} = \alpha_Y Y_{it} + u_{it} \quad (6.2)$$

where i indexes firms and t is the time index

Z_{it}^{*} is value of the characteristic in consideration

Y_{it} is the export status (0,1)

α_Y is a parameter to be estimated

u_{it} is the error term assumed to be iid.

The premium is calculated as the mean in the data set pooled across 2007–2013.

This simple export premium does not control for differences in firms' characteristics, like firms' location and industry type. Incorporating these characteristics gives the conditional export premium. It is defined as the difference in the mean level with other characteristics, location and industry type being controlled. This is done by estimating the multivariate regression for the whole seven year period controlling for industry and location.

$$lnZ_{it}^{*} = \beta_Y Y_{it} + \beta_Z Z_{it} + \beta_T T + \beta_D D + v_{it} \quad (6.3)$$

where Z_{it} is the vector of firm characteristics above

T is a vector of time dummies

D is a vector of industry and location dummies

β_Y, β_Z, β_T and β_D are vectors of parameters to be estimated

v_{it} is the iid error term.

The export premium is calculated as follows:

$$\left[(Z_{it}^{*exporter} - Z_{it}^{non-exporter})/Z_{it}^{non-exporter}\right] * 100 \quad (6.4)$$

After estimating all the parameters, the simple exporter premium is calculated as

$$(e^{\alpha_Y} - 1) * 100 \quad (6.5)$$

The conditional exporter premium is calculated as

$$(e^{\beta_Y} - 1) * 100 \quad (6.6)$$

The two parameters α_Y and β_Y describe the difference between exporters and non-exporters.

Table 6.4: Summary of expected signs of dependent variables for export premium model

Variable	Variable descriptions	Expected signs
Exporter	Having exporting activity (1=yes,0=no)	
Revenue	Total sales	+
Employment	Total employees	+
TFP	Total factor productivity	+
Wage	Total labour payment divided by total employees	+
Capital intensity	Capital size per total employees	-
Age	Number of years in business	+

Source: *Author's construction*

6.3.3.2 Self–selection

A firm will decide to export if the net expected profit from this decision is positive. Foreign market participation may incur some costs in collecting market information, and adjusting production processes and products to satisfy foreign customers. Most of these costs are due to their sunk nature. With the assumption that entry sunk costs are not occurring if they did not export last period, a firm will look beyond the current stage in the exporting decision (Tybout, 1997).

The export variable can be formulated in the presence of sunk costs:

$$Y_{it} = \begin{cases} 1 \; if \; \beta X_{it-1} - N(1 - Y_{it-1}) + u_{it} > 0 \\ 0 \qquad\qquad\qquad otherwise \end{cases} \tag{6.7}$$

where N is the sunk entry costs of exporting

Y_{it} is a binary variable indicating exporting status

X_{it-1} is the firm specific factors affecting exporting decision

u_{it} is the iid error term.

The variable of interest is TFP, considered as a key indicator that determines the trend of being an exporter. Other observable firm characteristics are capital intensity, wage, firm size, age, and firm foreign ownership.

Capital intensity is also included in the estimation. While firms in developing countries export labour-intensive products, their counterparts in developed countries

export capital-intensive produced goods. Therefore, labour-intensive firms in a developing country tend to export and so workforce quality and wage rates will be important.

Firm size is considered to have a positive relation to the firms' exporting status. Larger firms can benefit from their size via economies of scale in production due to greater demand. Larger firms can mobilize resources and absorb risks, thus they can adapt to the standards of foreign markets. In addition, accessing remote markets requires more resources that only firms of a certain size can afford (Majumdar, 1997; Alvarez and Crespi, 2003; Taymaz, 2005).

It is also believed that ownership has influence on firms' exporting behaviour. FIEs are considered to be more competitive than their domestic counterparts. Thus, FIEs are more likely to become exporters with the advantages of their experience and knowledge of overseas markets. This increases their likelihood to export (Bartelsman et al., 2000; Demsetz and Villalonga, 2001; Criscuolo, 2005).

Firm age is also an important determinant. Because firms with long trading history are more likely to seek foreign markets for further development, older firms tend to pursue exporting activities (Majumdar, 1997; De Kok et al., 2006; Cucculelli et al., 2014). In addition, firm age sometimes has a close relation to experience, performance and firm size.

The self-selection model of export decision is therefore specified as:

$$P(Y_{it} = 1) = \theta(TFP_{it-1}, Y_{it-1}, size_{it-1}, lnKL_{it-1}, age_{it-1}, FIE_{it-1}, dummies) \quad (6.8)$$

where $\theta(.)$ is a normal cumulative density function.

KL is capital intensity to proxy for the use of technology of firms. Firms in developed countries are believed to export capital-intensive products while their counterparts in developing countries export labour- intensive ones.

It can be estimated by probit with panel data. Using random and fixed-effects models often properly treat the problem of unobserved firm heterogeneity. Two specifications are used: first, using probit with unobserved effects to identify the determinants of firms' exporting decision; second, Heckman's random-effects dynamic probit is applied to control for unobserved effects and the dynamic process. Dummy

variable are included, one each for industry, region and time to proxy for spatial, industrial and regional characteristics.

6.3.3.3 Learning-by-exporting

This subsection looks at the LE hypothesis suggesting that firm productivity increases after entering export markets.

This section investigates the effects of exporting on firm productivity by employing a matching technique to overcome the problem of self-selection. A propensity score matching (PSM) technique makes consistent comparisons between exporters and non-exporters. It was introduced by Vahter (2002) and Girma et al. (2004) and since then has been widely used by a number of studies such as Heckman et al. (1997) and Becker and Ichino (2002).[15] The matching method resolves all the systematic differences related to both the exporting decision and firm productivity.

Following the methodology of Heckman et al. (1997), the average treatment effect on the treated (ATT) of exporting firms is calculated. The ATT evaluates the effect of exporting activities on firm performance. The ATT for exporters is defined as:

$$E(\Delta A^1_{it+s} - A^o_{it+s} | Y_{it} = 1) = E(\Delta A^1_{it+s} | Y_{it} = 1) - E(A^o_{it+s} | Y_{it} = 1) \quad (6.9)$$

where ΔA_{it+s} is firm i's outcome at period $t+s$ $(s > 0)$

Y_{it} is a binary variable indicating exporting status of firm i at period t

ΔA^1_{it+s} is the outcome at time $t+s$ of firm i that exported at t $(Y_{it} = 1)$

A^o_{it+s} is the outcome of firm i that has not exported.

The matching technique is used to estimate the counterfactual outcome by finding a valid control group among non-exporting firms. The counterfactual is estimated by the corresponding average value of the outcome of non-exporting firms. The basic principle of matching is to select for the non-exporters group that does not have any difference with the exporter group.

After building the control group through matching, causal effects of exporting on productivity are estimated by the new sample consisting of the exporter group and matched control group. The impacts of both exporting participation and exporting

[15] This has become a very popular approach for estimating causal treatment effects, especially when evaluating labour market policies but it is also used in diverse fields of study.

involvement will be investigated.

The equation explaining TFP of firm i at time $s > 0$ is

$$\ln A_{is} = \beta_0 + \beta_{0Y} Y_{i0} + \beta_{0z} Z_{i0} + \beta_S s + \beta_{YS} Y_{i0} s + \beta_{ZS} Z_{i0} s + \mu_i + \tau_i \quad (6.10)$$

where Y_{i0} is dummy variables indicating different exporter statuses

Z_{i0} is the observed firm-specific factor in the base year

μ_i is unobserved firm effect.

Taking annual average differences between t= 0 and $s > 0$, yielding

$$\frac{1}{s}(lnA_{is} - lnA_{i0}) = \beta_S + \beta_{YS} Y_{i0} + \beta_{ZS} Z_{i0} + \varphi_{is} \quad (6.11)$$

with $\varphi_{is} = \tau_{is} - \tau_{i0}$.

In a difference–in-differences approach, time trend, unobserved firm effects and observed firm characteristics are controlled.

β_{YS} represents ATT in terms of log of growth rate of TFP.

In this study, the matching process will be implemented by Becker and Ichino (2002) STATA algorithm. Specifically, the sample is divided into k intervals regarding the propensity score p_i, and checked whether the average propensity score between the treated and controlled units is not different in each interval. If the test fails over a period of time, the interval is divided into half and the test of differences is repeated until it stays in each time period. Then, the necessary condition of the equilibrium hypothesis is examined. If in each interval, the means of each characteristic are not different between the treated and controlled units, this condition is considered to be satisfactory.

6.4 Empirical results

6.4.1 Export premium

From equation (6.3), the estimated coefficient β of the export variable denotes the superiority of exporters over non-exporters in the same industry. Table 6.5 presents the results.

Table 6.5: Export premium

Variables	Simple export premium (%)	Conditional export premium (%)
Revenue	258.27***	50.52***
TFP	27.55***	16.42***
Employment	312.80***	158.57***
Average wage	3.27	4.5
Capital intensity	-20.01***	-42.79***
Capital	226.48***	150.49***
Age	32.29***	14.64***

Note: ****, **, * denote 1 percent, 5 percent and 10 percent significant level respectively.*

Source*: Author's calculation from VES*

At the unconditional mean, employment and revenue in exporting firms are about nearly 300 percent higher than those in non-exporters. The positive export premium remains the same with smaller magnitudes. In terms of the conditional export premium, the largest premium is in employment and capital, then revenue, followed by later TFP and age. All these differences are statistically significant at 1 percent level, except for wages, indicating that exporters are significantly larger than non-exporters.

Exporters also have high premiums in TFP in comparison to non-exporters. In terms of experience years, exporters are better than non-exporters in terms of TFP, size and age. In particular, exporters are more productive. The premium estimates for TFP are positive and significant. However, this finding does not indicate how these variables are related. This will now be considered.

6.4.2 Self-selection hypothesis

The self-selection hypothesis will be tested, according to Bernard and Jensen (1999) in terms of what is the possibility of a non-exporter becoming an exporter if productivity increases.

In this section, the estimated coefficients representing the marginal effects of each explanatory variable on the link function in probit models are presented. The direction of related effect is shown by the signs of these parameter estimates. The model (1) is probit in pooled data, the model (2) is Heckman's random-effects dynamic probit model.

Table 6.6: Effects of TFP on exporting probability

Dependent variable: $Export_t$		
Variables	Coefficients	
	(1)	(2)
Ln TFP_{it-1}	0.432***	0.666***
	(0.0466)	(0.0120)
Ln KL_{it-1}	-0.0907***	-0.0844***
	(0.0227)	(0.0491)
Ln $Wage_{it-1}$	0.0414	0.00370
	(0.0550)	(0.0953)
Ln $size_{it-1}$	0.320***	0.578***
	(0.0162)	(0.0427)
Ln age_{it-1}	0.0315	0.0861
	(0.0316)	(0.0431)
FIE_s	0.676***	1.337***
	(0.0492)	(0.187)
Industry FEs	Yes	Yes
Year FEs	Yes	Yes
N. of obs	33,132	33,132

Note: ****, **, * denote 1 percent, 5 percent and 10 percent significant level respectively.*

Source*: Author's calculation from the VES.*

The positive and statistically significant coefficients of TFP imply firms with higher productivity in Vietnam tend to self-select into foreign markets Hypothesis 6.2 cannot be rejected. The results of this study are consistent with empirical studies that find SE mechanisms in developing countries like Indonesia (Blalock and Gerler, 2004) and China (Girma, 2004; Park et al., 2010).

As far as capital intensity is concerned, both models with negative sign show that firms with smaller ratio of capital to labour tend to export. It indicates that firms with labour-intensive status are more likely to serve foreign markets. Reduction in capital-labour ratio is a rational response of manufacturing firms to the move to a more liberalized trade regime. This is consistent with the theoretical prediction that an integrating country's production patterns change toward using more relative abundant production factors. As a result, trade liberalization may have induced manufacturing industries to exploit the nation's comparative advantage that is unskilled labour, to achieve higher productivity. It is consistent with other studies' findings that entering exporting activities is due to the increase in productivity and capital (Yasar, 2005, Kazem, 2010) and the export premiums reported in Table 6.5.

The effect of average wage is positive and statistically insignificant. It could

be explained that the majority of Vietnamese exporters operate in labour-intensive sectors and offer a lower average wage.

As for other observable variables, firm size and firm age are also determinants of exporting probability. The significant impact of firm size on serving foreign markets is also large. Firms with larger size are more likely to pursue exporting activities. Firms with many years of doing business might be more efficient when accessing exporting transactions. Moreover, FIEs is also a significant determinant, having up to twice the effect as that of TFP.

The estimates indicate that the Vietnamese manufacturing firms with higher productivity tend to select into serving foreign markets because of their capacity to cover the entry sunk costs, considered as the entry barrier of engaging in international trade.

6.4.3 Learning-by-exporting

In this section, the study examines whether exporting participation could enhance firms' productivity. Propensity score matching (PSM) is used to estimate the impacts of the determinants of exporting participation. PSM is undertaken for the entry year of serving a foreign market and that of one year later. The estimated coefficients of the determinants of exporting participation are presented in Table 6.7. All the variables with a one-year lag are statistically significant. Using a one-year lag prevents all the reserve causation to firm characteristics from export activities.

Table 6.7: Determinants of the manufacturing firm entering into export activities

Variables	Coefficients Entering year	Coefficients After one year entering
Lag TFP	0.2132***	0.4307***
	(0.0863)	(0.0586)
Lag Size	0.1292***	0.0840***
	(0.0384)	(0.0274)
Lag FIEs	0.5087***	0.3674***
	(0.1765)	(0.1348)
Industry effects	Yes	Yes
Year effects	Yes	Yes
N. of obs	33,132	24,920

Note: ****, **, * denote 1 percent, 5 percent and 10 percent significant level respectively.*

Standard errors presented parentheses.

Source*: Author's calculation based on the VES.*

Firms need time to acquire and then adjust their capacity to exploit the benefits of export. Specifically, there may be a gap between the time of export participation and

the time for the benefit of this participation to be realised. Differences in exporting experiences seem to be an important differentiating factor of firms.

After finding the probability of the firms' entry into exporting activities, firms are matched by the one-to-one nearest neighbour matching method for matched controls. The PSMATCH (Becker and Ichino, 2002) is employed for this estimation. After applying the PSM technique, the estimated ATT is shown in Table 6.8.

Table 6.8: Effects of exporting behaviour on firm performance

	TFP		Employment		Revenue	
	Entering year	After one year entering	Entering year	After one year entering	Entering year	After one year entering
ATT	0.1532 (0.0854)	0.1789 (0.0662)	0.0950* (0.0502)	0.1526 (0.0765)	0.0708 (0.0324)	0.0837 (0.0475)
Export Starters	769	385	769	385	769	385
Non-exporter	32,363	24,535	32,363	24,535	32,363	24,535

***Note**: ATT denotes the average treatment effects on the treated after controlling for selection effects.*

****, **, * denote 1 percent, 5 percent and 10 percent significant level respectively.*

Standard errors in parentheses

***Source**: Author's calculation based on the VES.*

With the evidence in Table 6.8, it is reasonable to state that the learning effects from exports on TFP are significant. Exports have a positive correlation with firms' TFP with 15.3 percent increase in TFP when starting exporting. This finding is consistent with the LE studies in Indonesia (Blalock and Gerler, 2004) and China (Park et al., 2010). In addition, it is significant that the exports of the previous period have impacts on firm size and revenue. After participating in exporting activities, firms have opportunities to increase their employment in later years. Exporting induces a higher growth rate of revenue.

In terms of the balancing check, the quality of matching (Table 6.9) is efficient through the reported *t*-tests results (Table 6.9). In the matched sample, there are no significant differences in the characteristics of the entrants serve the foreign market and the matched non-exporters.

Table 6.9: Comparison of treated and control in the matched sample (entering year)

Variables	Mean		*p*-value
	Treated	Control	
Lag TFP_{it}	1.5123	1.4878	0.00***
Lag $Size_{it}$	4.0275	4.0561	0.00***
Lag FIEs	0.2385	0.1638	0.00***

***Notes**: Treated units are export starters, control units are never exporting firms.*

****, **, * denote 1 percent, 5 percent and 10 percent significant level respectively.*

***Source**: Author's calculation based on the VES.*

The interpretation of the estimation results gives fact inherent in a developing country like Vietnam. The previous sections explain the presence of export performance superiority in Vietnam's manufacturing sector. The phenomenon widely observed in almost all other countries does also prevail in Vietnam. The superiority of exporter is caused from both positive self-selection and exporting effects. Larger firms have higher probability to be exporters due to their size advantage and foreign demand allowing them to have their revenue and employment grow faster than non-exporters. Exporting is good for the firms in the sense that exporting can induce higher growth of TFP and revenue of exporting firms.

In summary, exporting participation has been found to have expected, significant and robust impacts on firm performance, supporting the theoretical LE mechanism. Serving foreign markets is a good way to enhance TFP for the Vietnamese manufacturing firms. It is likely that the increase in TFP stemming from exports comes through in a later period rather than in the entry year. After participating in the export market, under the impact of foreign markets, firms' capital and size tend to be larger, contributing to the increase of revenue. Firms must take advantage of their capacity and knowledge absorbed from overseas partners for better performance in the future.

6.5 Conclusion

The aim of the research in this chapter is to empirically investigate the causality between exporting activity and productivity for the Vietnamese manufacturing firms. Significant empirical evidence is presented to show that Vietnamese exporting firms have higher productivity than non-exporters. However, the remaining question is whether the causal influence is from entry to exporting increasing productivity (SS hypothesis) or it is in the other direction – that exporting increases productivity (LE hypothesis). Using data from Vietnam and following the methodology of Bernard and

Jensen (1999), the study finds a statistically significant two-way correlation between those two factors. This trend appears to be consistent with the theoretical prediction for a developing country that trade liberalization has promoted foreign trading. Generally, SS and LE mechanisms are supported.

This chapter contributes to the literature on heterogeneous trade theories by providing empirical evidence from a country in the process of trade liberalization. This research also provides the specific mechanisms of the export and productivity linkages. Once firms decide to serve foreign markets, they need to be well-prepared in terms of capital and labour utilized. When participating in exports, there is a competition between rivals from the importing countries and other similar products, together with customers' selections with diversified needs. Thus, only firms with better performances can overcome these obstacles. During the early time of exporting, firms have certain expenses including such as advertising and new investment costs, which will increase the cost of goods manufacture. If offering higher prices, firms might not sell the goods and consequently make a loss. The advantage of scale will help businesses to lower and cover the cost of goods manufactured, creating more competitive prices to access foreign markets. Therefore, firms with better performance in comparison to others are able to participate in export markets and grow stronger. After participating in exports, firms' capital and size increase significantly and meanwhile profit has also improved.

In such a context of fast-paced international economic integration, the findings of this chapter have important policy implications. Although the exports structure could be changed by industrial and commercial policies, the Vietnamese Government needs to encourage and help capture the benefits of both SS and LE mechanisms. Higher productivity will increase SS and exports by more international competition.

Chapter 7

Conclusions and policy implications

7.1 Overview

Over the course of three decades since Renovation in 1986, the Vietnamese Government has continuously implemented policies which complemented efforts with its important partners in the Asia-Pacific region and European Union to accelerate international economic integration. Such efforts help to transform Vietnam from a centrally-planned economy to an extensive market-oriented one, in order to achieve high economic growth and rapid poverty reduction. This was detailed in Chapter 2. Trade liberalization is an important part of this transformation which has helped Vietnam become more integrated with the world economy.

During the period of accelerated international economic integration, the industry and trade policy regime has experienced profound changes to become more liberal due to the implementation of Vietnam's commitments under several regional FTAs including AFTA, USVBTA, ACFTA and WTO frameworks. As explained in Chapter 3, the rapid removal of non-tariff barriers, follow-up tariff reduction and harmonization of legal systems are among the significant outcomes from accession to the WTO. Consequently, all of these exerted influence on FDI flows and foreign trade expansion in Vietnam. It is expected that such changes would positively affect the performance of the manufacturing sector following the dawn of WTO accession.

7.2 Key findings

This thesis has investigated the WTO accession and explores how Vietnamese manufacturing has responded to this critical change in terms of productivity, the selection of firms and exports. The empirical analysis began examining changes in the trade policy regime, related policy reforms and the impacts of trade reforms on the level of manufacturing protection over the period 2007−2013. Given the background of policy changes, the impact of trade liberalization and manufacturing performance has been investigated in three aspects: (i) the change in firm TFP in Chapter 4, (ii) the pattern of competitive firm selection in Chapter 5 and (iii) the causal relationship between firms' export participation and TFP in Chapter 6. The results obtained from the empirical analysis are summarized below to address the overall objective of this

thesis – to analysis of the effects of WTO accession on the firm level performance of the manufacturing sector in Vietnam.

In Chapter 4, it was found, as expected, that various trade reforms have resulted in substantial reduction in manufacturing protection. The estimates of input and output tariffs show a consistent trend of significant import liberalization between 2007 and 2013. The import-competing industries, particularly agriculture–based industries experienced the largest decline in protection levels. While export-oriented industries appeared to have the second largest reduction in protection, their real incentives came from various export promotion measures and the better access to the export markets due to the effect of Vietnam's regional, bilateral and multilateral trade agreements. Manufacturing industries producing intermediate goods, machinery and equipment enjoyed a slight increase in trade barriers. Despite the impressive pace of import liberalization, a number of import-competing and export-oriented manufacturing industries producing consumer goods still had protection rates significantly higher than those in capital and intermediate good industries. This problem resulted from a large number of rates in the tariff system and could be an important cause of the limited development of supporting industries producing intermediate goods. Overall, the decisive policy shift to trade opening was inevitable, leading to a sharp change in the business environment for manufacturing firms.

The empirical results of Chapter 4 provide strong evidence of the robust and positive impact of trade liberalization on firm-level productivity in Vietnam. Various trade reforms have resulted in substantial reduction in manufacturing protection as expected. The estimated input and output tariffs show a consistent trend of significant trade liberalization between 2007 and 2013.

Lower levels of protection with lower input tariffs and output tariffs are significantly associated with higher TFP. A larger inflow of imports appears to promote the improvement in manufacturing productivity. In addition, other domestic policy reforms represented by the competition index of individual industries also have a significant and robust effect on manufacturing TFP, suggesting that more competition is conducive to manufacturing productivity improvement. The ownership type of firms is also important in explaining differences in TFP. The positive and significant impact of FDI lends support to the argument that the FDI sector plays a leading role in driving manufacturing TFP due to its inducing advanced technology and management.

Furthermore, firm size in terms of employment is found to be positively related to TFP. This means that larger firms seem to be more efficient than smaller firms. Examination of the firm-specific characteristics indicates that all firms became larger in employment size and lower in capital intensity. Therefore, it may be concluded that existing firms have become more productive by using more labour and significantly reducing capital intensity. This trend in capital intensity is attributed to the competition-induced incentive effects of trade liberalization and other associated domestic reforms, which induced manufacturing firms to exploit cheaper factors of production in a more competitive market. This trend is also consistent with the patterns of Vietnam's manufactured trade specialization. Some robust evidence is found to show that Vietnam's trade liberalization, in the first decade following Vietnam's WTO entry, has had an overall positive impact on productivity.

The empirical results presented in Chapter 5 indicate that the productivity of entering, surviving and exiting firms simultaneously increase, suggesting that the productivity level increased after WTO accession. All existing firms became larger in employment size. Therefore, it may be concluded that the existing firms have become more productive by using more labour. This chapter also examines the process of resource reallocation in terms of firm turnover and its implications on the TFP growth under trade liberalization. Since 2007, there has been an increase in the contribution of the reallocation effect to aggregate productivity growth, indicating the appearance of resource reallocation between firms. This trend is consistent with the theoretical prediction review in Chapter 3 on the recent models of international trade and firm heterogeneity.

Moreover, Chapter 5 finds that the within-effect has been the main driver of aggregate productivity growth. Because the between-effects are negative, the market share reallocation does not necessarily contribute positively to aggregate productivity growth in Vietnam. It indicates that reallocation of outputs and inputs from less productive to more productive firms do not make a greater contribution to industry productivity improvement. Entry costs are expected to be a barrier for new firms to enter the market. Overcoming this burden might create opportunities for the firms' operation. Subsequently, trade liberalization and domestic reform have promoted manufacturing TFP in conformity with Vietnam's comparative advantages. The findings suggest that Vietnam's continuing efforts to improve this effect are necessary

to enhance aggregate productivity growth.

The empirical analysis in Chapter 6 examines the causality between firms' export and productivity by appropriate econometric methods with controls for unobserved firm effects. The findings strengthen the indication of the difference between the productivity of exporters and non-exporters. The productivity-enhancing effect of export expansion seems to exist in the context of trade liberalization in Vietnam. TFP is a solid foundation for export decision determinants of firms. Once entering the foreign market, firms need proper preparation on capital and size. Firms with higher TFP are likely to participate in foreign markets in accordance with their comparative advantage. Chapter 6 also confirms the critical significant of the reserve effect of exporting on firm performance. The results also indicate the increase in exports will be the motivation for businesses to continue maintaining exporting activities. The firms need to improve their productivity before they export, and exporting in turn promotes firm productivity. The proper evidence about export decision determinants that are idiosyncratic to a developing country under a fast track of reform like Vietnam is consistent with the findings of other empirical studies.

The main contribution of this thesis is to provide a significant amount of empirical evidence to add to the existing literature on trade and firm performance, showing the positive impact of trade liberalization on manufacturing productivity performance in the case of a transitional economy. Using Vietnam's firm-level data, the thesis examines the mechanism in which tariff reduction can affect firm performance.

Many of these issues were formulated in terms of objectives and research questions. The associated hypotheses detailed in Chapter 1 were each tested and the results are detailed in Table 7.1.

Table 7.1 Summary of empirical test for the research hypothesis

	Hypotheses	Methodogy	Results	Compare
H4.1	Output tariff reduction increases firm-level TFP.	LP and Fixed effect	Cannot reject	Consistent with Fernandes (2007), Konings (2007) and Topalova (2013).
H4.2	Input tariff reduction increases firm-level TFP.	LP and Fixed effect	Cannot reject	Consistent with Goldberg et al. (2008), Lileeva and Trefler (2010), Ha & Kyota (2014).
H5.1	Exiting firms have lower TFP levels than incumbents.	Aw et al. (2001)	Cannot reject	Consistent with Baldwin and Gorecki (2007), Brown (2008), Aghion (2009), Audretsch (2009) and Verhoeven (2011).
H5.2	Entry firms have lower TFP levels than incumbents	Aw et al. (2001)	Cannot reject	Consistent with Farina (2010), Vahter (2012), Liu (2015).
H5.3	Entry firms are more productive than surviving firms	Aw et al. (2001)	Cannot reject	Consistent with Baldwin and Gorecki (2007), Brown (2008) and Verhoeven (2011),
H5.4	Firm productivity improvement is the main contributor to productivity growth.	Baily et al. (1992)	Cannot reject	Consistent with Foster et al. (1997), Carreira and Texeira (2009)
H6.1	Exporting manufacturing firms are more productive than non-exporting ones.	Multivariate regression	Cannot reject	Consistent with Arnold and Hussinger (2005), Fernandez and Isgut (2005)
H6.2	More productive manufacturing firms are more likely to enter into export markets.	Probit	Cannot reject	Consistent with Girma, Greenaway and Kneller (2004), Arnold and Hussinger (2005)
H6.3	Vietnamese manufacturing firms increase their productivity by learning-by-exporting.	Matching	Cannot reject	Consistent with Bernard and Jensen (2004), Arnold and Hussinger (2005), Van Biesebroeck (2008), Hahn (2014)

***Source**: Author's compilation*

Whilst these results generally accord with studies for other countries, they are the first comprehensive firm-level analysis of manufacturing in Vietnam, which is experiencing rapid change since accession into the WTO in 2007. This new knowledge will be used to consider some implications for future policy prescriptions.

7.3 Policy implications

Under deeper integration commitments, the WTO accession has brought both opportunities (FDI attraction, foreign trade expansion, economic institutional reform)

and challenges (the pressure to implement the commitments with the WTO members and direct competition of imported goods) to Vietnam. Drawing from the major implications of the thesis, the followings are some recommendations to allow Vietnam to achieve sustainable development in the post-WTO accession.

First, Vietnam should develop a comprehensive and consistent legal and regulatory system conducive to functional markets. Promoting competition is vital in making the business environment conducive to productive-induced effects. The reform of the SOE sector should be continued toward reducing and eliminating preferential treatment and access to key productive resources as well as further reducing the share of the SOEs in manufacturing activities. Any remaining SOEs should be exposed to market disciplines to operate on the grounds of productivity. Enhancing the active participation of the private sector in exporting activities should be under consideration. Various supporting actions related to foreign market information services or export administrative procedures should be implemented for a long time so firms have enough time to apply their experience absorbed from serving foreign markets in their operation. These reforms would help to avoid the violation of Vietnam's commitment under the WTO and other trade agreements.

Second, the investment environment should be further improved, with an emphasis including regulatory and administrative procedural reforms. The aims are to reduce the number of obstacles resulting from weak institutions (bureaucracy), and to create a healthy business environment to sharpen competitiveness with regional countries in attracting FDI. As the FDI sector is leading in technology and management practices, the government's policy measures should support domestic enterprises to increase their links through subcontracting with FDI firms.

Third, Vietnam ought to focus on training a skilled labour force. The government should upgrade the skills of the existing manufacturing labour force through learning-by-doing and on-the-job training programs. Various incentives should be considered to encourage firms to provide on-the-job training and for workers to upgrade skills by themselves. Incentives may also be given to vocational training centers or schools to provide affordable training for workers by supporting the expansion of vocational training providers. Meanwhile, policies to enhance sharing information between firms and outside partners such as universities, research institutes and professional associations should be conducted. The Vietnamese Government

should focus on policies to help enterprises strengthen their capacity to train human resources to improve the skilled workforce rather than policies to help businesses proceed with investment activities in R&D. The government also needs to make policies to increase management capacity and promote the entrepreneurial spirit of business owners.

Fourth, research shows that exports have a major impact on productivity changes and increase firms' competitiveness. Therefore, the Vietnamese Government should implement programs to help domestic firms intensively engage in exporting activities. Policies of government should focus on the following three core issues: (1) focusing on supporting micro enterprises to participate in the internationalization process by linking micro-sized enterprises together, linking SMEs with SOEs and FIEs, (2) enhancing absorption capacity for firms and (3) supporting firms to seek markets and legal consulting when participating in international markets. Vietnam should speed up the changes of export-import structures by taking them to the next level in the global value chain. Low competitiveness export-import structures can hinder Vietnam from reaping the possible benefits of trade liberalization under the WTO regime and FTAs. The faster output expansion of many import-competing industries compared with export-oriented activities seems to be enhanced by domestic demand growth. The need to pay more attention to the domestic market appears to be relevant in Vietnam with its large population.

In addition, firms' use of capital requires a good infrastructure base. New investments induced by trade liberalization have been resulting in increased demand for infrastructure. Therefore, the active role of government to mobilize resources in infrastructure development is required in dealing with this national issue.

Vietnam is one of the fastest growing economies in Southeast Asia, and with a stable governance and ease of doing business, Vietnamese firms are likely to succeed in joining the digital transformation to stay afloat in the Industry 4.0 era. Digital transformation is the application of digital technologies to change business models and create new business opportunities, and to increase revenue and value. It can also change operation and leadership methods, working processes and corporate culture. The Vietnamese government should review and revise investment policies in order to attract domestic and foreign investments in export production. Besides, the credit insurance for exporters should be promoted, creating favourable conditions for taking loans from

credit organizations in order to increase the volume of exports and improving access to international markets.

Furthermore, the Vietnamese Government should focus on policies to help enterprises strengthen their capacity to train human resources to improve the skilled workforce rather than policies to help businesses proceed with investment activities in R&D. The government also needs to make policies to increase management capacity and promote the entrepreneurial spirit of business owners. Meanwhile, policies to enhance sharing information between firms and outside partners such as universities, research institutes and professional associations should be conducted. Finally, the Vietnamese Government should relax formal credit policies to help firms approach funding more easily.

The empirical analysis in this thesis provides evidence on the impact of the WTO on Vietnam – a new developing WTO member. The impact is clearly strong on the import-export side and firm performance. This implies that a developing country derives benefits from WTO membership.

7.4 Limitations and suggestion for further research

While the thesis examines the important relationships between trade liberalization and firm performance in Vietnam, there is scope for future research.

At the time of writing and estimating this thesis the latest available data was over the period of 2007−2013, which is now out of date. The most recent survey of the General Statistics Office (GSO) of Vietnam was in 2015 and the results were only released internally. Therefore, the 2014 dataset could be used to provide an update.

In addition, this study deals only with the determinants of the firms' decision to export. However, they are not comprehensive because exporting behaviour consists of export decisions, level of export involvement decisions as well as exporting destination decisions. This would require case study follow-up research.

This thesis focuses on the manufacturing sector and further research could consider the agriculture and service sectors. The project could be expanded to a more comprehensive study in a number of ways.

First, a broad perspective examination of firm performance under trade liberalization of the whole economy could be exploited. This analysis can be

implemented using an extended general enterprise dataset, covering all sectors of the economy. Second, the study of the relationship between TFP and poverty reduction in Vietnam can be extended to provide significant policy implications and prescriptions.

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Appendix

Table A4.1: Summary Statistics for Value Added, 2007-2013 (million VND)

Variable	Obs	Mean	Std. Dev.	Min	Max
2007	12,154	6,245	23,132	0.7	835,218
2008	13,429	5,644	22,132	0.8	779,747
2009	14,391	5,936	21,623	0.7	630,064
2010	16,229	6,840	26,951	2.3	898,973
2011	18,117	6,440	23,780	1.9	690,801
2012	19,599	7,274	27,747	1.8	799,490
2013	21,699	7,096	25,319	0.6	822,263

Source: *Author's calculation from VES*

Table A4.2: Summary Statistics for Labour, 2007-2013 (number of employees)

Variable	Obs	Mean	Std. Dev.	Min	Max
2007	12,161	209	765	10	49,441
2008	13,447	200	814	10	62,088
2009	14,406	207	808	10	55,467
2010	16,248	203	767	10	53,896
2011	18,139	191	797	10	67,434
2012	19,914	179	735	10	59,940
2013	21,755	178	805	10	74,377

Source: *Author's calculation from VES*

Table A4.3: Summary Statistics for Capital, 2007-2013 (million VND)

Variable	Obs	Mean	Std. Dev.	Min	Max
2007	12,126	25,762	102,045	4.8	4,758,219
2008	13,396	25,831	115,548	1.5	6,001,501
2009	14,348	26,469	107,059	4.9	5,496,829
2010	16,172	28,469	126,819	6.5	7,096,777
2011	18,021	28,265	176,782	1.1	8,224,345
2012	19,476	31,977	285,457	1.7	6,774,194
2013	21,573	31,112	154,975	2.5	8,534,140

Source: *Author's calculation from VES*

Table A4.4: Summary Statistics for Intermediate Input, 2007-2013 (million VND)

Variable	Obs	Mean	Std. Dev.	Min	Max
2007	11,567	24,806	68,049	0.9	786,253
2008	12,796	23,966	66,624	0.8	754,196
2009	13,806	24,530	66,274	0.8	727,561
2010	15,527	26,031	67,444	0.7	704,376
2011	17,254	25,562	64,092	0.7	647,858
2012	18,490	23,376	57,374	0.6	596,122
2013	19,895	24,986	59,357	0.6	551,241

Source: *Author's calculation from VES*

A4.5: Estimation of total factor productivity

In the framework of Levinsohn and Petrin (2003), the demand for intermediate input m_t is assumed to depend on the firm's state variable k_t and ω_t:

$$m_t = m_t(k_t, \omega_t)$$

With the assumption that this demand function is monotonically increasing in ω_t , ω_t is as a function of k_t and m_t :

$$\omega_t = \omega_t (k_t, m_t)$$

The estimation equation can be rewritten as

$$v_t = \beta_t l_t + \varphi_t (k_t, m_t) + \eta_t$$

With $\varphi_t (k_t, m_t) = \beta_0 + \beta_k k_t + \omega_t (k_t, m_t)$

This equation will be estimated in two stages, as proposed by Levinsohn and Petrin (2003). The coefficient β_t will be consistently in the first stage using the OLS method after substituting a third-order polynomial approximation in k_t and ω_t in place of $\varphi_t (k_t, m_t)$. The second stage identifies the coefficient β_k , after making a consistent non-parametric approximation to the expectation of ω_t and using GMM approach.

The program "levpet" was written in Stata® by Petrin et al. (2004).

A4.6: The generalized method of moments (GMM)

The generalized method of moments (GMM) will be applied to estimate this model. This method proposed by Hansen (1982) is now one of the most widely used estimation methods in empirical economics and finance. The GMM estimation framework is based on the population moment conditions and presumes that all the moment conditions given are correctly specified, or the population orthogonality condition is a priori assumed to hold.

Arellano and Bond (1991) derived a consistent generalized method of moments (GMM) estimator for the parameters of this model. This estimator is designed for datasets with many panels and few periods, and it requires that there be no autocorrelation in the idiosyncratic errors. For a related estimator that uses additional moment conditions, but still requires no autocorrelation in the idiosyncratic errors.

The Arellano and Bond Estimator

Model

$y_{it} = \alpha_i + x_{it}\beta + \varepsilon_{it}$

$i = 1, 2, ..., N$

$t = 1, 2, \ldots T$

x_{it} are exogenous

Lagged dependent variable: $y_{it} = \alpha_i + \gamma\, y_{it-1} + x_{it}\beta + \varepsilon_{it}$

Therefore y_{it-1} is endogenous

Arellano and Bond (1991) suggest that:

Step 1: Eliminating α_i by first differencing, so we have: $\Delta y_{it} = \gamma\, \Delta y_{it-1} + \beta\, \Delta x_{it} + \Delta\varepsilon_{it}$

For firm (i):

$$\begin{cases} \Delta y_{i3} = \gamma\, \Delta y_{i2} + \beta\, \Delta x_{i3} + \Delta\varepsilon_{i3} \\ \Delta y_{i4} = \gamma\, \Delta y_{i3} + \beta\, \Delta x_{i4} + \Delta\varepsilon_{i4} \\ \ldots\ldots\ldots\ldots\ldots \\ \Delta y_{iT} = \gamma\, \Delta y_{iT-1} + \beta\, \Delta x_{iT} + \Delta\varepsilon_{iT} \end{cases} \quad (1)$$

Step 2: Choosing instruments for Δy_{it-1}:

y_{i1} is a valid instrument for Δy_{i2}

y_{i1} y_{i2} are valid instruments for Δy_{i3}

Similarly, y_{i1} y_{i2} … y_{iT-2} are valid instruments for Δy_{iT-1}

The matrix of instruments

$$\begin{bmatrix} y_{i1} & 0 & 0 & 0 & 0 & 0 & \dots & 0 & 0 & \dots & 0 \\ 0 & y_{i1} & y_{i2} & 0 & 0 & 0 & \dots & 0 & 0 & \dots & 0 \\ 0 & 0 & 0 & y_{i1} & y_{i2} & y_{i3} & \dots & 0 & 0 & \dots & 0 \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \ddots & \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & 0 & 0 & 0 & 0 & \dots & y_{i1} & y_{i2} & \dots & y_{iT-2} \end{bmatrix} \qquad (2)$$

i = 1, 2, … N

Step 3:

One-step GMM: using instrument matrix (2) assume homoscedasticity

Two-step GMM: using instrument matrix (2) for the system (1) with i = 1, 2, … , N

Table A4.7: Number of firms, by industry and by year

VSIC	Sector	2007	2008	2009	2010	2011	2012	2013
15	Food product and beverages	2,460	2,655	2,712	2,864	3,066	3,224	3,431
16	Tobacco	19	19	19	19	19	19	19
17	Textiles	556	658	763	815	899	993	1,082
18	Wearing apparel	977	1,016	1,102	1,266	1,447	1,565	1,916
19	Leather product and footwear	370	392	374	431	492	541	652
20	Wood and wood product	920	1,031	1,112	1,356	1,541	1,701	1,842
21	Paper and paper products	510	583	620	683	733	807	854
22	Publishing, printing	347	389	422	466	504	552	588
23	Coke, refined petroleum products	11	12	18	15	11	17	25
24	Chemicals and chemical products	500	553	659	727	801	870	913
25	Rubber and plastics products	615	725	841	965	1,056	1,205	1,310
26	Non-metallic mineral products	1,245	1,344	1,410	1,550	1,802	2,025	2,232
27	Basic metals	243	290	350	423	475	510	578
28	Fabricated metal products	1,147	1,319	1,416	1,700	1,982	2,320	2,528
29	Machinery and equipment	340	350	372	430	472	502	544
30	Office, accounting and computing machinery	12	13	18	21	20	25	29
31	Electrical machinery	221	227	260	263	285	323	356
32	Television and communication	112	121	136	158	177	213	239
33	Medical and optical instruments	37	44	50	55	51	61	67
34	Motor vehicles	203	223	180	208	237	242	247
35	Other transport equipment	336	370	378	439	490	526	527
36	Furniture and other manufactures	960	1,095	1,175	1,370	1,532	1,642	1,755
	Total	12,135	13,797	14,007	16,944	18,000	19,136	21,980

Source: *Author's calculation from VES*

Table A4.8: Herfindalh Indices of Two-digit Manufacturing Industries, 2007-2013

VSIC	Sector	2007	2008	2009	2010	2011	2012	2013
15	Food product and beverages	0.003	0.003	0.003	0.002	0.002	0.002	0.002
16	Tobacco	0.132	0.101	0.101	0.098	0.102	0.104	0.111
17	Textiles	0.013	0.011	0.009	0.008	0.007	0.006	0.005
18	Wearing apparel	0.007	0.007	0.006	0.004	0.004	0.003	0.002
19	Leather product and footwear	0.016	0.013	0.014	0.012	0.009	0.010	0.007
20	Wood and wood product	0.010	0.010	0.007	0.006	0.005	0.004	0.004
21	Paper and paper products	0.014	0.009	0.008	0.009	0.007	0.006	0.006
22	Publishing, printing	0.032	0.029	0.028	0.024	0.021	0.016	0.016
23	Coke, refined petroleum products	0.215	0.225	0.187	0.195	0.213	0.164	0.138
24	Chemicals and chemical products	0.009	0.009	0.007	0.006	0.005	0.004	0.004
25	Rubber and plastics products	0.008	0.006	0.006	0.005	0.004	0.003	0.003
26	Non-metallic mineral products	0.006	0.005	0.006	0.006	0.004	0.003	0.003
27	Basic metals	0.030	0.025	0.019	0.015	0.012	0.011	0.008
28	Fabricated metal products	0.009	0.007	0.006	0.004	0.003	0.003	0.002
29	Machinery and equipment	0.017	0.021	0.019	0.013	0.012	0.012	0.012
30	Office, accounting and computing machinery	0.199	0.199	0.199	0.199	0.149	0.149	0.149
31	Electrical machinery	0.026	0.022	0.019	0.018	0.014	0.011	0.010
32	Television and communication	0.032	0.030	0.030	0.024	0.023	0.021	0.018
33	Medical and optical instruments	0.094	0.098	0.085	0.081	0.088	0.077	0.053
34	Motor vehicles	0.027	0.035	0.026	0.022	0.021	0.020	0.016
35	Other transport equipment	0.017	0.018	0.018	0.014	0.010	0.010	0.011
36	Furniture and other manufactures	0.008	0.006	0.005	0.005	0.004	0.004	0.003

Source: *Author's calculation from VES*

Table A4.9: Tariffs reduction and firm productivity: OLS and Random effects estimators

Dependent variable : ln TFP				
Variables	Coefficients			
	OLS		Random effects	
Output tariff	-0.515***	-0.514***	-0.698***	-0.698***
	(0.00330)	(0.00330)	(0.00530)	(0.00530)
Input tariff	-0.139**	-0.0987***	-0.169***	-0.0987***
	(0.0664)	(0.0163)	(0.0626)	(0.0163)
HFI		-0.069***		-0.069***
		(0.0341)		(0.0341)
Output tariff*HFI		-0.0079***		-0.0079***
		(0.00309)		(0.00309)
AGE	-0.0449***	-0.0449***	-0.0298***	-0.0298***
	(0.0019)	(0.0019)	(0.00022)	(0.00022)
SIZE	0.142***	0.142***	0.0997***	0.0997***
	(0.0063)	(0.0063)	(0.0155)	(0.0155)
SOE	0.345***	0.346***	0.506***	0.510***
	(0.0676)	(0.0676)	(0.126)	(0.126)
FDI	0.527***	0.525***	0.833***	0.832***
	(0.0198)	(0.0198)	(0.0365)	(0.0365)
Constant	-0.572*	-0.453**	-0.685**	-0.453**
	(0.301)	(0.189)	(0.267)	(0.189)
N	73,896	73,896	73,896	73,896
R squared	0.324	0.383	0.5461	0.546
Number of firms			21,980	21,980

***Notes**: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

***Source**: Author's calculation.*

Table A5.1: Annual TFP growth of manufacturing industries

VSIC	Sector	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013
15	Food product and beverages	0.068	0.071	0.075	0.082	0.110	0.201
16	Tobacco	0.116	0.119	0.124	0.130	0.043	0.399
17	Textiles	0.134	0.186	0.193	0.121	0.187	0.245
18	Wearing apparel	0.246	0.315	0.326	0.347	0.208	0.280
19	Leather product and footwear	0.181	0.195	0.271	0.275	0.513	0.225
20	Wood and wood product	0.123	0.127	0.135	0.145	0.194	0.146
21	Paper and paper products	0.114	0.121	0.122	0.132	0.155	0.185
22	Publishing, printing	0.113	0.118	0.121	0.134	0.134	0.162
23	Coke, refined petroleum products	0.245	0.262	0.310	0.312	-0.028	0.040
24	Chemicals and chemical products	0.076	0.089	0.098	0.104	0.294	0.208
25	Rubber and plastics products	0.098	0.123	0.153	0.164	0.207	0.269
26	Non-metallic mineral products	0.045	0.065	0.076	0.088	0.163	0.219
27	Basic metals	0.099	0.115	0.123	0.133	0.290	0.345
28	Fabricated metal products	0.158	0.161	0.179	0.185	0.222	0.237
29	Machinery and equipment	0.138	0.158	0.154	0.169	0.249	0.187
30	Office, accounting and computing machinery	0.192	0.241	0.349	0.357	-0.249	-0.061
31	Electrical machinery	0.089	0.085	0.091	0.117	0.121	0.216
32	Television and communication	0.164	0.168	0.158	0.161	0.042	0.281
33	Medical and optical instruments	0.169	0.195	0.212	0.316	0.219	0.219
34	Motor vehicles	0.148	0.152	0.167	0.162	0.206	0.335
35	Other transport equipment	0.049	0.057	0.059	0.062	-0.026	0.197
36	Furniture and other manufactures	0.167	0.186	0.213	0.241	0.180	0.198
	Total	0.157	0.165	0.192	0.201	0.231	0.273

Source: *Author's calculation from VES*

A6.2 Variable Definition and Construction

Exporter: A dummy equal to 1 if a firm is an exporter and 0 otherwise. A firm is defined as an exporter at a given period of time if its direct exports account for at least 10 percent of its sales in this period, and non-exporter otherwise. The 10 percent threshold is used in many other papers in the literature, even by the World Bank itself, to classify exporters and non-exporters. This definition is adequate for identifying the firms as exporters that have a minimum interest in serving foreign markets, abstracting from minimal trade relationships due to sample shipments or border proximity. Those firms having started exporting by the year 2007 is reported as exporters in 2007

A.6.3: Comparison of treated and control (one year after entering)

Variables	Mean		*p*-value
	Treated	Control	
Lag TFP_{it-1}	1.6234	1.5989	0.00***
Lag $Size_{it-1}$	4.1386	4.1672	0.00***
Lag FIEs	0.3496	0.1749	0.00***

***Notes**: Treated units are export starters, control units are never exporting firms.*

****, **, * denote 1 percent, 5 percent and 10 percent significant level respectively.*

***Source**: Author's calculation*